FIRST AID AND HEALTH

FIRST AID
AND
HEALTH

PREPARED BY
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FOR THE USE OF
BELL SYSTEM EMPLOYEES

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CONTENTS

PART ONE—FIRST AID

	PAGE
Introduction	3-4
CHAPTER I	
Principles of First Aid; Obtaining a Doctor's Services; Types of Injuries; Bruises; Wounds	5-8
CHAPTER II	
Infection	9-12
CHAPTER III	
First Aid Dressings	13-37
CHAPTER IV	
Controlling Bleeding	38-46
CHAPTER V	
Rescue; Artificial Respiration	47-58
CHAPTER VI	
Ammonia Inhalants; Shock; Fainting; Sun Stroke and Heat Exhaustion; Apoplexy; Epilepsy	59-63
CHAPTER VII	
Fractures	64-73
CHAPTER VIII	
Strains and Sprains; Dislocations	74-78
CHAPTER IX	
Burns and Scalds; Blisters; Frost-Bite	79-82
CHAPTER X	
Foreign Bodies; Hernia; Bites	83-89
CHAPTER XI	
Poison Ivy; Other Skin Irritations; Poisons and Their Antidotes	90-96
CHAPTER XII	
Transportation	97-108
CHAPTER XIII	
Bell System First Aid Kits	109-110
Index	141-148

CONTENTS

PART TWO—HEALTH

PAGE

Introduction 113

CHAPTER I

Aids to Health 115-120

CHAPTER II

Hygienic Precautions for Disease Prevention 121-122

CHAPTER III

Respiratory Diseases—Colds, Coughs, Sore Throat, Grippe (Influenza) and Hoarseness 123-126

CHAPTER IV

Intestinal Disturbances—Indigestion, Diarrhea and Constipation 127-129

CHAPTER V

Headaches; Vertigo; Lumbago 130-132

CHAPTER VI

Symptoms Indicating Conditions Which Need Attention 133-136

CHAPTER VII

Correction of Physical Impairments; Periodic Health Examination; Vaccinations and Inoculations; Antitoxin 137-138

CHAPTER VIII

Medicine Cabinets 139

Index 141-148

PART ONE

FIRST AID

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INTRODUCTION

As prevention of accidents is far better than cure, it should be the individual's concern to recognize conditions which may cause an accident and then to conduct himself in meeting these conditions so that the accident will not occur. It is well known that accidents occur less frequently and, as a rule, are less severe among people trained in first aid. This can be readily understood when it is realized that people so trained better understand the seriousness of all injuries and naturally have in mind at all times their possible causes and what should be done to prevent them.

Accidents occasionally occur, however, in spite of all precautions and it is very important to understand the proper thing to do if first aid measures are necessary. Frequently people are so located that considerable time would elapse before a doctor could arrive in case of an accident. Therefore, it is for the individual's own good and the good of his fellow-workers that he have a thorough knowledge of first aid. With this knowledge, in case of an emergency, he is in a position to know just what to do and equally or more important, what not to do, since improper handling of the injured person may seriously interfere with the doctor's services when he takes charge of the case. A person with a thorough knowledge of first aid, in case of a minor injury is able to prevent the development of more serious consequences and in serious accidents the manner in which first aid is applied will do much towards making the doctor's services more effective when he arrives. In all cases, proper first aid measures will reduce suffering and increase the chances for speedy recovery, and, in many instances, life may be saved by efficient first aid work rendered during the first few minutes after a serious accident.

The important thing in all accident cases is to think *clearly* and *quickly*, not to get excited, and to "keep cool" under all circumstances. If it is necessary to stop severe bleeding or to restore breathing, this should be done very quickly and the attempt should not be given up until a doctor takes charge. However, these are about the only cases where first aid work must be rushed and even in restoring breathing, after once starting, the First Aider should not hurry but must maintain continuously the same rhythm of applying and releasing pressure. In all other kinds of injury, start the first aid work at once but do not hurry and be sure to do the work thoroughly.

Remember that it is sometimes impossible to determine at the outset how serious an injury may be, and every precaution should be taken to render first aid so that it will be proper for any degree of seriousness.

Chapter I

PRINCIPLES OF FIRST AID; OBTAINING A DOCTOR'S SERVICES; TYPES OF INJURIES; BRUISES; WOUNDS

Principles of First Aid

The five general principles to be applied as they may be necessary in first aid work are:

1. Obtaining a doctor's services.
2. Stopping bleeding.
3. Restoring breathing.
4. Making the patient as comfortable as practicable.
5. Doing only what is needed. In many cases, attention that is not needed may harm the patient.

The greatest accomplishment from the application of first aid is the saving of life. Therefore those things which may save life should be done first, such as obtaining a doctor's services, stopping bleeding and restoring breathing.

The details in regard to each of these principles will be explained in the text in connection with rendering first aid. However, since it is necessary to consider "Obtaining a doctor's services" in connection with all first aid work, this matter is explained in the following paragraphs before discussing injuries and first aid methods in detail.

Obtaining a Doctor's Services

Unless an injury is very slight always obtain a doctor's services. Be sure, however, to give whatever first aid is necessary even though the doctor is called. If alone with an injured person, give first aid and then try to get a doctor.

If an injured person can go to a doctor, find out where the nearest doctor or hospital is located and have him go, or take him to the doctor or Emergency Room to have the injury attended to. In outlying territory or where there is no hospital in the neighborhood, take the patient to the nearest doctor. Generally it is better to call a doctor on the telephone before going to his office in order to make sure that he is in.

If an injured person cannot go to a doctor and if located in a territory where there is ambulance service, call, or have someone else call, an ambulance. This can be done by saying to the telephone operator "I want an ambulance" and telling her the location of the injured person.

If located in a territory where there is no ambulance service, the Chief Operator can have you connected with the nearest doctor. In all cases in calling a doctor or ambulance, be prepared to give the following information:

1. Location of injured person.
2. Nature, cause, and probable extent of injury.
3. What first aid is being given.

It should be remembered that the kind of information furnished the doctor is important to him in rendering treatment. For example, the amount of violence and the kind of object which causes a wound should be explained to the doctor. For the same reason, in telling a doctor the circumstances which produced the injuries, information that the man fell twenty feet to a concrete pavement is more helpful from his standpoint than just the mere statement that the injured man fell from a pole.

If there are indications that the injured person is injured more severely than at first thought; if there is any doubt as to the extent of the injuries; or if the patient suffers a relapse, call or recall a doctor to attend the patient.

In every case where the services of a doctor are obtained, the Supervisor should be notified at once in order that the Company may take such action as seems desirable

Types of Injuries

Injuries resulting from accidents constitute the reason for obtaining a doctor's services and for the application of the other first aid principles previously outlined. It is well, therefore, to know the types of injuries resulting from accidents. These are:

(a) Mechanical—including bruises, wounds, fractures, sprains, strains, dislocations, and foreign bodies in the cavities or open spaces or in the soft parts of the body.

(b) Thermal—including burns, scalds, and freezing.

(c) Chemical—including gas asphyxiation and other forms of suffocation.

(d) Electrical.

(e) Results of accident—including shock and fainting.

Bruises

A bruise (or contusion) is an injury to the soft parts of the body without a break in the surface and generally causes the well-known black and blue spot that results from the breaking of small blood vessels under the skin. Examine the bruise carefully to be sure that no bones are broken. When the bruise is painful apply cloths wrung out in very cold water, but never hold ice on a bruise on a child. Do not let the bruised part hang down as this position tends to increase the pain.

Wounds

A wound is a break in the soft parts of the body. This break may, or may not, appear at the skin surface. For example, in the case of a broken arm, the bone may not have punctured the skin, but if the break is complete the soft parts around the broken ends are injured and there is an internal wound.

Kinds of Wounds.—The amount of violence and the thing producing the violence which caused the wound determine its character and severity. Therefore, wounds may be classified according to the nature of the object which produced them. For example:

(a) Wounds caused by edged articles are straight-cut or *incised* wounds.

(b) Wounds caused by things which cut and tear are usually *lacerated* wounds. Falls against door jambs or other angular surfaces, scrapes, brush-burns, etc., and machine injuries are examples of conditions which produce wounds of this type.

(c) Wounds caused by objects which also bruise are *contused* wounds. These may be produced by falls to the ground, being struck by a falling manhole lid, or other dull, blunt surface.

(d) Wounds caused by pointed or puncturing objects are known as *puncture* wounds. These may be produced by ends of wire, pins, nails, pencils, etc.

Chapter II

INFECTION

One of the principal dangers in connection with open wounds, no matter how small, is that germs may be introduced. This is known as infection. It is very important when giving first aid treatment for an open wound, to avoid infection. In the prevention of infection, the following points should be remembered:

(a) Avoid accidents because accidents may cause open wounds which give the germs access to the body.

(b) A cut or tear of skin that is dirty allows the introduction of more germs into the underlying soft parts than such wounds in comparatively clean skin. Soiled clothing in direct contact with an open wound and objects that cut, scratch, or puncture the skin may also cause infection.

(c) When open wounds occur, use something to destroy or make harmless the germs. The most universally used substance for this purpose is iodine. Nature washes most of the dirt and germs out of cuts with a flow of blood so that a *moderate* amount of bleeding is helpful in any open wound. After the flow of blood has stopped, the iodine should be worked down into the

depths of the wound. The surrounding skin should be painted with the iodine from the wound outward.

Prevention of Infection.—As mentioned above, it is necessary to use a germicide to guard against infection whenever the skin is broken and no matter how slight the bleeding or even in the case of a scratch. Do not use it unless the skin is broken, because if the skin is not broken the germs can not enter and the germicide is, therefore, not required. Iodine is a generally used germicide and is supplied in the First Aid kits in small ampoules. After iodine has been used to kill the germs, other germs must be prevented from entering the wound by completely covering it with a sterile compress.

Since the application of a concentrated solution of iodine would cause a burn, the iodine used as a germicide is a mixture of iodine and alcohol and is generally known as tincture of iodine. If this is kept in a bottle and the cork frequently removed and replaced the tincture increases in strength, due to the evaporation of the alcohol, and will eventually become a concentrated solution which if applied will burn the skin. To prevent this the iodine in the Bell System swab is sealed in a glass tube, excluding the air and preventing the evaporation of the alcohol. The proper mixture is thus always available for application.

To use the Iodine Swabs provided in the First Aid kits, proceed as follows:

Hold the tube vertically with the slip-cover at the top. Hold the slip-cover up just enough to expose the glass tube and break at the scored line by suddenly applying pressure with the fingers. Remove the applicator and with it work the iodine down into the wound and paint the surrounding skin from the wound outward. Refill the applicator by dipping it in the iodine as many times as is necessary.

Breaking. Applying.

Fig. 1.—Iodine Swab.

In the case of a puncture wound such as that caused by a piece of wire or a splinter, if practicable, make the wound bleed by squeezing. Then force the filled applicator into the wound with a rotating motion and remove it slowly so that the iodine reaches the bottom of the wound. It is always best to see a doctor in case of a puncture wound unless the wound is very slight. Before removing a splinter, always paint the surface with iodine.

After treatment with iodine, cover the wound with a suitable compress to keep out dirt, and, if necessary, hold the compress securely in place with a bandage. Never touch the wound with anything except the iodine and compress. Do not wash the wound before or after the iodine is applied. The water will add to the danger of infection and will dilute the iodine. Do not disturb blood clots, for example, do not tear a compress off a wound to reapply iodine.

Tetanus or lockjaw germs grow when air is excluded. Therefore, an open wound should never be sealed up; as for example, by completely covering it with adhesive tape, court plaster, or other dressings or bandages which completely exclude the air and which are not sterile.

When there is considerable bleeding from a wound, it is not necessary to use iodine while bleeding continues,

as the flow of blood will wash away any germs that have been introduced. After bleeding has stopped, apply the iodine, unless a compress was applied to assist in controlling the bleeding. In this latter case, leave the compress in place, even though no iodine has been applied since the profuse flow of blood has satisfactorily cleansed the wound.

Iodine should not be used on wounds very near the eye, and should never be applied to burns.

Chapter III

FIRST AID DRESSINGS

First aid dressings serve the purposes of covering, fixation, and preventing infection, and may be classified under three main headings:

Compresses.
Bandages.
Splints.

Compresses.—Compresses are used on burns treated with carbolated petrolatum or other suitable oils or greases, and on wounds treated with iodine. They are generally made of gauze or of cotton with a gauze outer covering. Cotton should never be placed in direct contact with an open wound or burn as it tends to stick and is difficult to remove without damage to the tissues that are forming in the healing process.

The purpose of covering a wound is to:

(a) Control bleeding through the formation of blood clots and to exert pressure on the blood vessels.

(b) Keep out germs and to otherwise protect the injured parts.

(c) Absorb blood and fluid from a cut or lacerated wound or burn.

Since a compress is for use directly on an open wound or burn, it should contain no germs, i.e., the compress should be sterile. Sterile compresses are manufactured in various sizes in order to be most serviceable for the kinds of wounds for which they are intended. When sterile compresses are not available, freshly laundered or clean handkerchiefs, towels, or linen may be used in emergencies.

The size of the compress should be large enough to cover the entire area of the burn or wound. If the tails provided on certain of the compresses are too short they may be spliced with 1 inch bandage. When there will be some delay before the doctor arrives or if the doctor's services are not required, it is best to cover the compress with a bandage.

The compresses provided in the Bell System First Aid Kits and their general uses are as follows:

4 Inch Compress.—This compress, when unwrapped and unfolded, is four inches square or by cutting or breaking the stitching the compress may be unfolded so that it will be about four by eight inches. It should be used on wounds or burns which are too large to be covered by a smaller compress.

1 Inch or 2 Inch Compress.—These compresses are used on small wounds or burns after proper treatment has been given. Which of the two sizes of compress to use depends, of course, upon the size of the area to be covered. In general, the 1 inch compress is to be used on a finger or thumb, and the 2 inch compress on a hand, wrist, ankle, or small wound on another part of the body.

Fig. 2.—Four-inch compress.

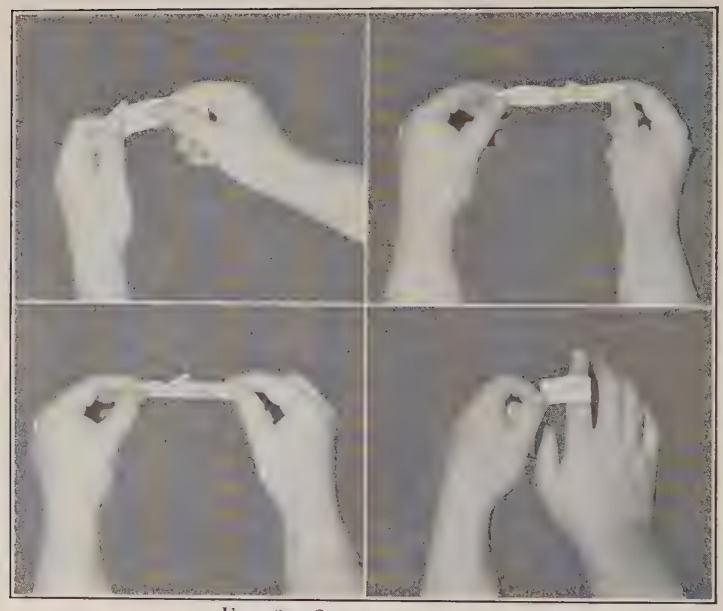


Fig. 3.—One-inch compress.

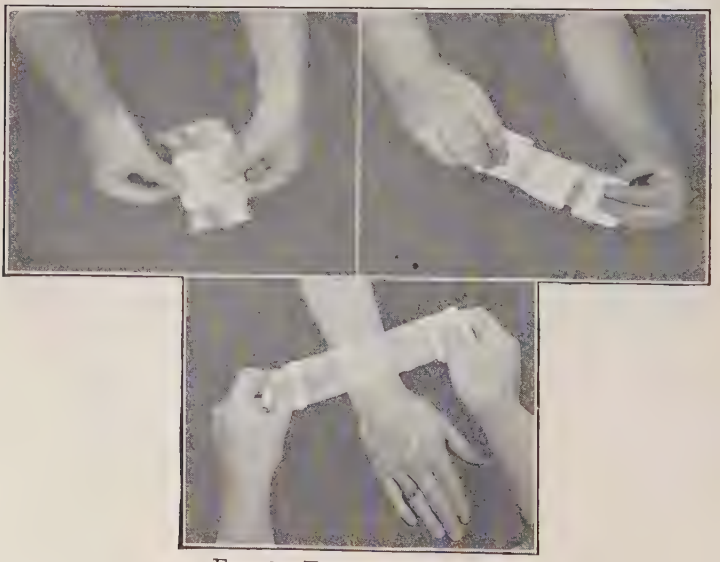


Fig. 4.—Two-inch compress.

Absorbent Gauze Compress.—This compress is generally used on wounds or burns which are too large to be covered by the 4 inch compress. It may also be used as padding for splints in the case of a fracture.

When used as a compress over a large wound or burn, the absorbent gauze should be held in place by a triangular bandage or by a 2½ inch bandage.

Fig. 5.—Absorbent gauze compress.

Bandages.—Bandages are used to hold compresses in place, to hold padding in place on splints, to hold splints in place, as slings for supporting injured members, etc.

The kind and size of bandage to be used depends on the purpose for which it is selected. In tying bandages square knots should be used.

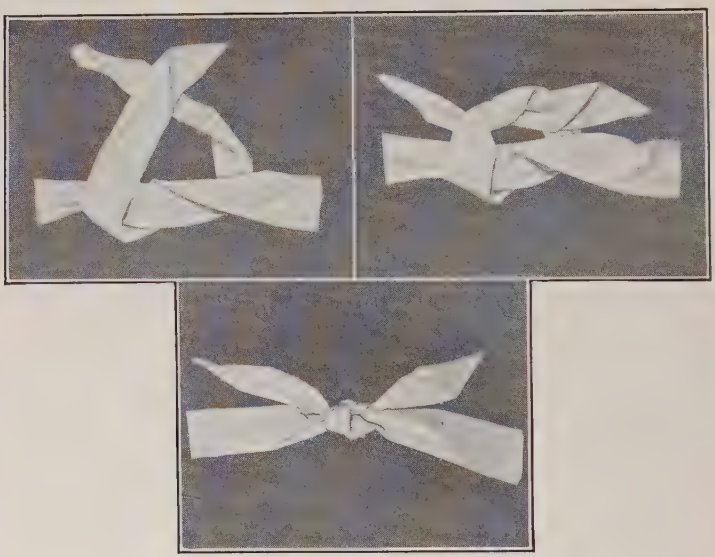


Fig. 6.—How to tie a square knot.

In general, there are two types of bandages, the triangular bandage and roller or pleated bandage. The methods for using these bandages are as follows:

Triangular Bandage.—The triangular bandage may be used as a sling, for holding padding in place on splints or for holding splints or absorbent gauze in place. It should never be placed directly on a wound or burn because it is not sterile and may cause infection. A description of its uses is as follows:

(a) **Arm Sling.**—Place one end of the bandage over the shoulder of the uninjured side. Allow the long side of the bandage to hang down the chest with the angle formed by the two short sides

behind the elbow of the injured arm. Bend the elbow of the injured arm to a right angle. Carry the corner of the bandage up over the injured arm and around the back of the neck. Tie the two ends of the bandage together with a square knot. Fold the corner of the bandage over the elbow and pin it in place with a safety pin. A knot tied in the apex of the triangular bandage may be used in place of the folded pinned apex.

Fig. 7.—Triangular bandage as arm sling.

(b) **Folded or Cravat Bandage.**—To prepare the bandage for use as a cravat bandage, select a location where you can lay the bandage on a comparatively clean surface and fold as shown in Figure 8. The cravat bandage is used to hold a compress securely in place; to hold splints in place; to hold padding on splints; as an eye bandage; over a broken rib; as a cheek bandage; as an ear bandage.

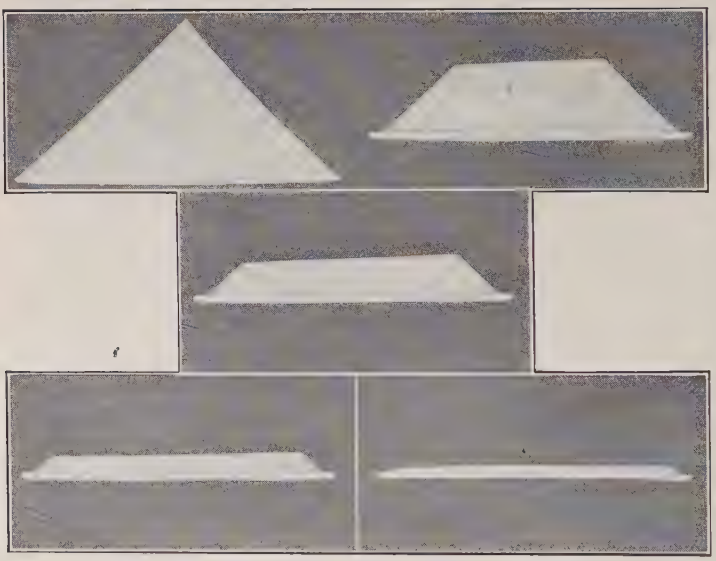


Fig. 8.—Triangular bandage folded as cravat.

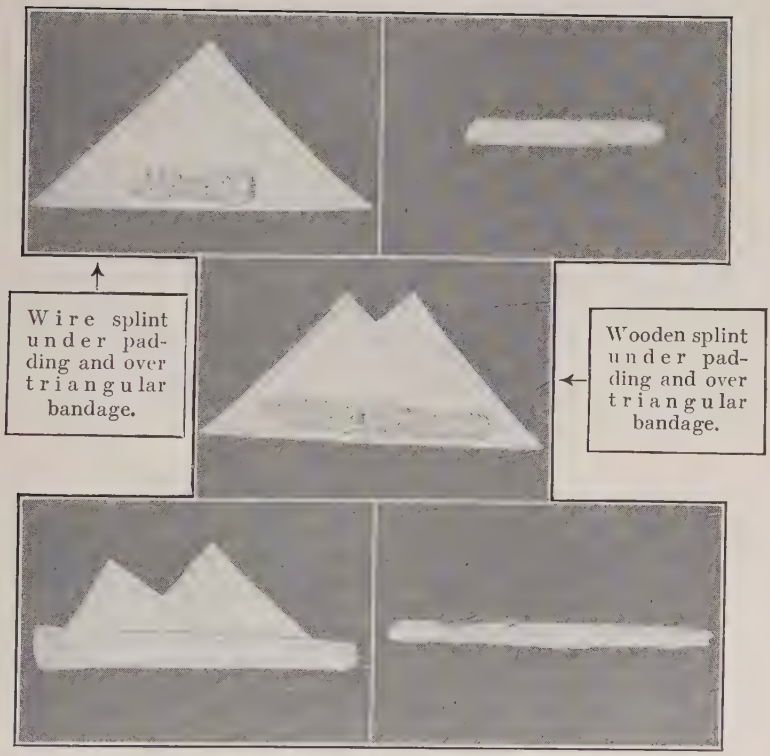


FIG. 9.—Triangular bandage to hold padding on wire and wooden splints.

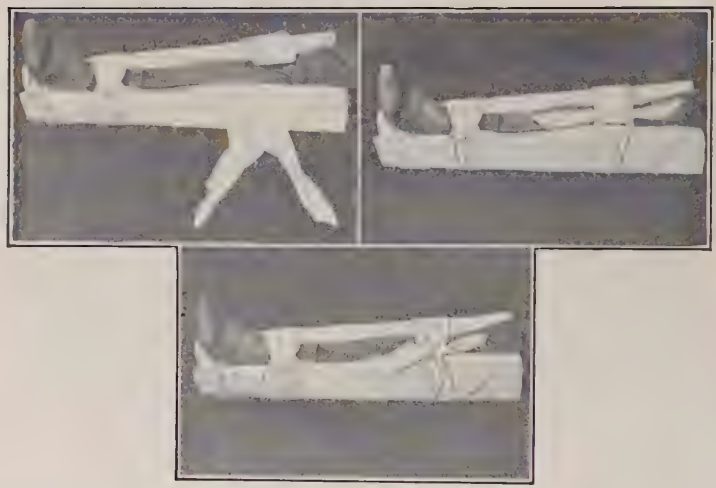


FIG. 10.—Triangular bandage to hold wooden splints.

FIG. 11.—Triangular bandage to hold wire splint.

Fig. 12—Eye bandage.

Fig. 13.—Bandage for fractured rib.

Fig. 14.—Cheek bandage.
Showing both the compress and cravat bandage covering.

Fig. 15.—Ear bandage.
Showing both the compress and cravat bandage covering.

(c) **Head Bandage**, for keeping a compress in place. Fold a hem about 1½ inches wide at the long side of the triangular bandage. Place the bandage so that the hem lies squarely across the forehead, just above the eyes, and the bandage is over the head with the point hanging down the back. Carry the two ends around the head above the ears, and cross just below the bump at

Fig. 16.—Head bandage.

the back of the head. Draw ends tightly, carry them around the head, and tie them in the center of the forehead. Draw the point down firmly, to hold compress securely against the head. Turn point up, fold and pin it with a safety pin at the back of the head.

(d) **Bandage Over a Compress on a Wound on the Shoulder,**

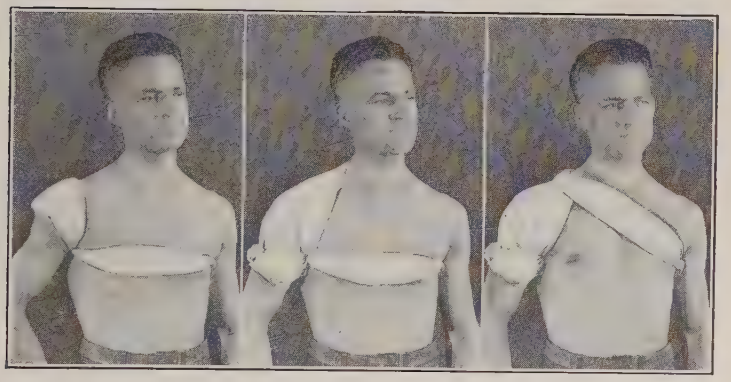


Fig. 17.—Shoulder bandage.

on the Chest or Back,

Fig. 18.—Chest or back bandage.

Tie apex of triangular bandage to one end of cravat bandage at shoulder, and tie other end of cravat bandage to triangular bandage just under shoulder.

on the Hip,

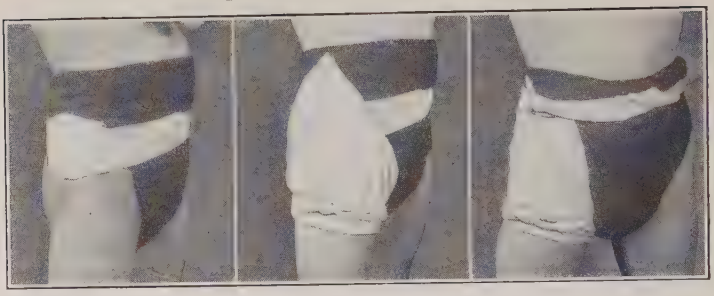


Fig. 19.—Hip bandage.

on the Groin.

Fig. 20.—Groin bandage.

(e) **Elbow and Knee Bandage to Cover Compress.**

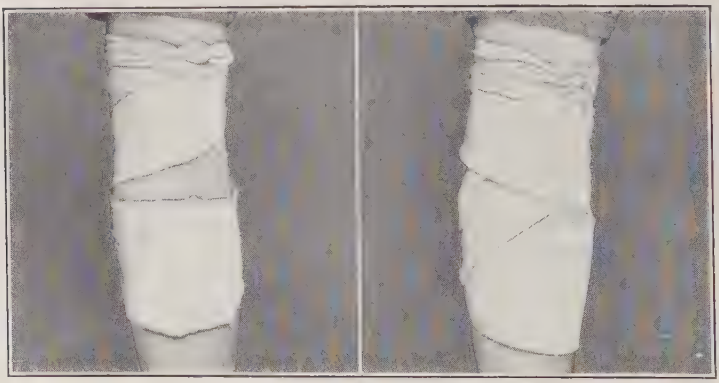


Fig. 21.—Triangular bandage for elbow.
Showing compress and cravat bandage covering.

(f) Hand or Foot Bandage to Cover a Compress.

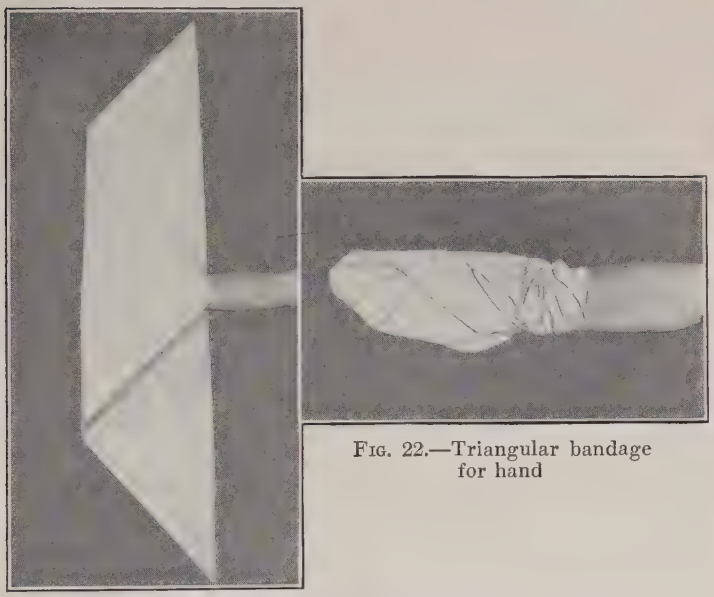


FIG. 22.—Triangular bandage for hand

(g) Special Hand Bandage to Hold Compress and to Control Arterial Bleeding.

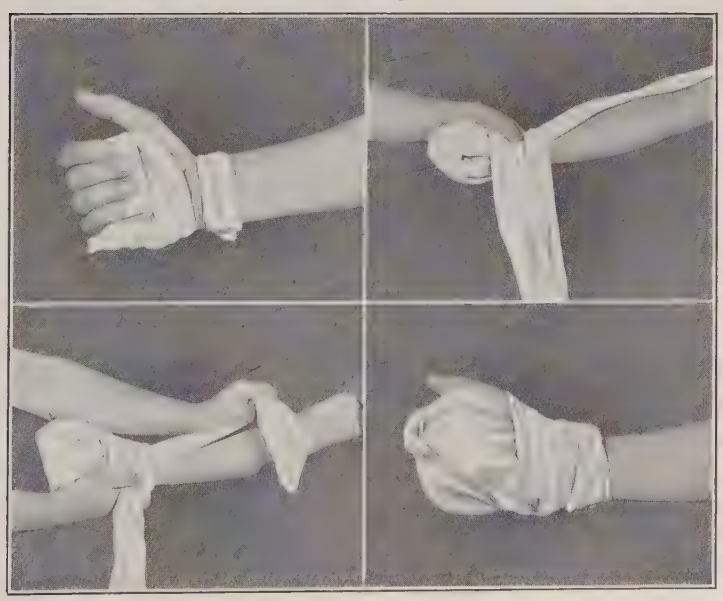


FIG. 23.—Special hand bandage.

(h) **Special Bandage to Support Sprained Ankle.**

FIG. 24.—Ankle bandage.

Roller or Pleated Bandage.—These bandages are strips of cotton gauze used principally to hold compresses or splints in place and for certain other special purposes which will be described later. They are designated according to their width. In using any bandages of this type, the following cautions should be borne in mind:

(a) Do not bandage over the ends of the fingers or toes unless it is to cover an injury. The ends of the fingers or toes should be left uncovered where possible so that it can be determined from their appearance whether or not the bandage is too tight. If the ends become swollen or bluish, the bandage should be loosened.

(b) Even when a bandage is properly put on, the swelling of the injured member may eventually make it too tight, so it should be watched closely and the bandage should be loosened if necessary.

(c) A bandage that is wet first shrinks as it absorbs the water and then slowly goes back to about normal length, so do not use a wet bandage if it can be avoided. If it is necessary to use a wet bandage, be sure that it does not tighten too much.

The *1 inch and 2½ inch bandages* are supplied in the First Aid Kits in heavy paper packages. Both of these bandages are used for the same purposes except that the smaller bandage is used on smaller parts of the body such as the fingers or toes, whereas the larger bandage is generally used on the hand, wrist, arm, or leg.

Either of the bandages may be used for holding small compresses securely in place, for splicing the tails of a compress, to hold padding in place on splints, and to hold splints in place.

FIG. 25.—Pleated bandage to hold padding.

Fig. 26.—Pleated bandage to hold splints.

In addition to these uses the 2½ inch bandage may be used to hold the absorbent gauze in place, generally on an arm or leg, and to wrap around the wire splints to hold them in place. When boards or other substitutes for the wire splints are used, it is generally better to use triangular bandages, if they are available, to hold the splint in place. In holding a large compress in place, the triangular bandage folded as a cravat bandage is easier to apply than the 2½ inch bandage, but if applied properly, a 2½ inch bandage will do very well for this purpose and results in a neater job.

In general, when using the 1 inch or 2½ inch pleated bandage, the following rules should be followed:

(1) Remove the glassine paper covering from the heavy paper container. Draw out about two or three inches of the end of the bandage without opening the container.

(2) Before starting to bandage, place the member in the position it is to have after the bandage is completed.

(3) Take a position facing the injured part.
(4) Hold the pleated bandage so that it will feed from the bottom and so that it will wrap from left to right, up, over, and under, as shown in Fig. 26. This is the direction traveled by the hands of a clock.
(5) Place the underside of the bandage over the dressing on the wound. The end may be secured with one or more wraps of the bandage if it is thought desirable. The bandage will feed out of the container as it is wrapped around the injured member.
(6) When the injured member is about the same size throughout the length to be bandaged, as the fingers, wrist, etc., wrap around and around the member overlapping each preceding turn one-third to two-thirds the width of the bandage. The bandage should lie flat against the injured member. It should not be loose or show wrinkles, nor be so tight that it stops circulation.
(7) When the injured member varies in size, as the leg below the knee or the arm below the elbow, etc., it will be noticed that if the bandage is wrapped around and around with the turns flat against the member, soon there will be wrinkles in the bandage and possibly bare spots between the consecutive turns. To avoid this, use a bandage applied as a "figure-of-eight" bandage. See Fig. 21 for a cravat bandage applied as a figure-of-eight and Fig. 30 for a pleated bandage so applied.
(8) After having completed the wrapping with a 1 inch or 2½ inch bandage and allowing enough end for the tie, cut the bandage off close to the container.
(9) To fasten the end of the bandage in place, slit the end into two tails with a pair of scissors or a

knife. Tie a half-knot where the two tails join. Bring the tails around the member in opposite directions and tie them together with a square knot.

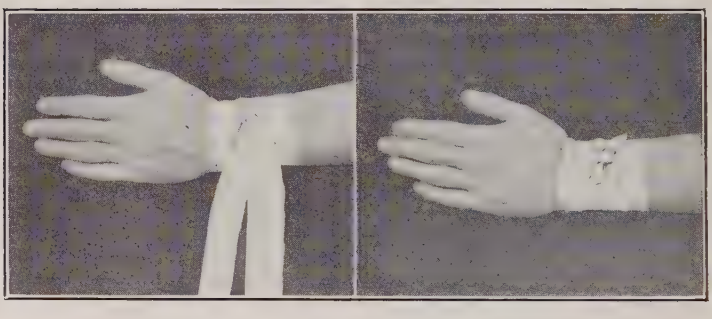


Fig. 27.—Tying pleated bandage.

Finger Bandage.—The method for bandaging one or two fingers is illustrated below:

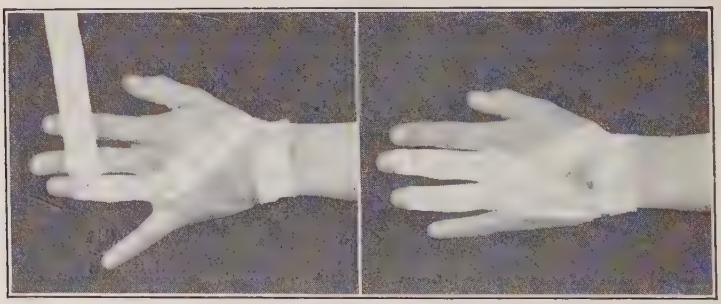


Fig. 28.—Finger bandage.

Always first anchor the bandage by two or more wraps around the wrist. If more than one finger are to be bandaged, begin with the one farthest to the right of the operator as he stands facing the injured hand with the palm down. Following this rule on the left hand, the operator will begin with the little finger, ring finger, middle

finger, or index finger, as the case requires; on the right hand he will begin with the thumb, index finger, etc., as the case requires. If more than two fingers are injured, use triangular hand bandage as shown in Fig. 22.

Hand Bandage.

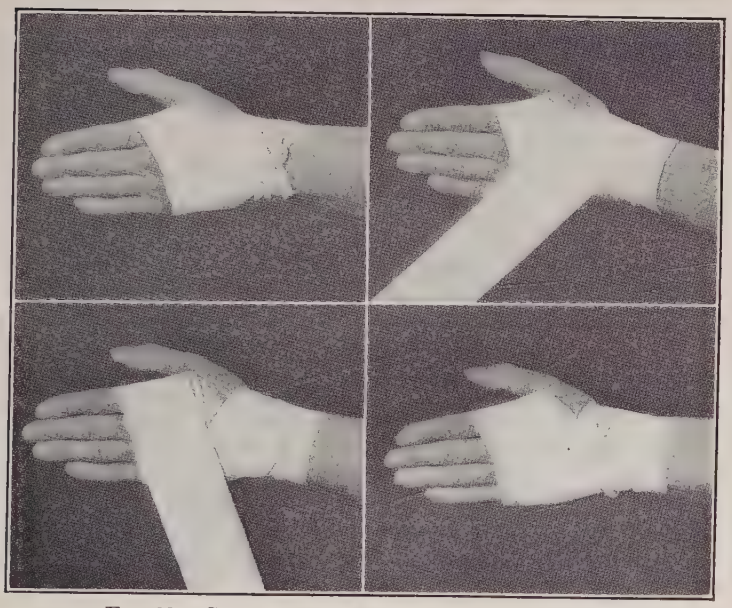


Fig. 29.—Compress and pleated bandage for hand.

Elbow Bandage.

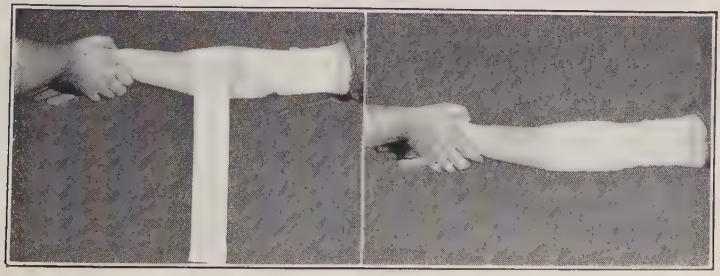


Fig. 30.—Pleated bandage for elbow.

Figure 30 shows how to start the "figure-of-eight" bandage on the elbow. To complete, repeat the whole process shown, overlapping each turn with about two-thirds of the width of the bandage and making the turns above and below the elbow farther and farther apart as the bandaging proceeds. This type of bandaging may be used in place of a triangular cravat bandage where it is necessary to keep the bandage securely in place over a joint.

Six Inch Bandage.—This bandage may be used to hold padding on splints, to hold splints in place and to hold compresses. When using the 6 inch bandage to hold splints in place the appearance of the completed job may be improved by folding the 6 inch bandage to half its normal width. Its use on the abdomen to hold a compress in place is illustrated below.

Fig. 31.—Six inch bandage for abdomen.

Splints.—Splints are for use in supporting a broken limb and should be so placed and bandaged that in gen-

eral no movement of the joint on either side of the break is possible. They may be of wire mesh or pieces of thin, flat board, or may be improvised from such things as umbrellas, canes, shovels, axe handles, folded blankets, folded newspapers, etc.

If wire splints are used one or both ends should be folded back as required to obtain the proper length and the splint should be grooved slightly before the padding is applied. This strengthens the splint and provides a more comfortable support for the injured member.

Chapter IV

CONTROLLING BLEEDING

Bleeding (or hemorrhage) is due to a break in the wall of a blood vessel, either an artery, vein, or capillary.

Bleeding from Arteries.—Bleeding from arteries is most dangerous, and immediate steps should be taken to control the bleeding or the result may be fatal. Arteries carry the blood from the heart to different parts of the body. The contractions of the heart force the blood through the arteries and when one is cut the blood spurts out in jets.

Blood from arteries is generally a brighter red color than blood from veins. However, in most severe injuries the blood is not bright red because a combination of both arterial and venous blood is formed.

Bleeding from Veins.—The blood returns to the heart through the veins, which may be recognized as the blue lines under the skin. When one of these is injured, the blood does not spurt, but flows freely.

Bleeding from Capillaries.—The capillaries are the smallest blood vessels and form a network everywhere in the body. Slight cuts or pricks of the skin will injure capillaries and cause bleeding. However, the blood slowly oozes out and, as a rule, is easily checked.

Factors Influencing the Amount of Bleeding.—The sight of blood frequently increases bleeding by causing excitement and an increase in the heart rate of the

injured person. It is, therefore, not advisable to permit an injured person to see blood, blood-stained clothes, or to discuss the extent of his injuries. He should be reassured and every attempt made to keep him quiet in order to allow the blood to clot. The position of the injured member may also increase bleeding as a part of the body that is hanging down or is in a low position tends to bleed more than a part that is elevated.

The loss of a considerable amount of blood frequently gives rise to certain symptoms: pale face; dizziness; gasping for breath; faintness with cold skin; and sometimes loss of consciousness. The severity of the symptoms depends on how much and how rapidly blood is lost.

Methods of Controlling Bleeding

Natural Control.—The control of bleeding may be natural or it may be necessary to resort to artificial measures. Bleeding from ordinary wounds frequently stops itself, since blood tends to clot or coagulate when exposed to air. If the wound is located in an arm or leg and the injured part is elevated, the bleeding will frequently stop of its own accord, due to gravity, particularly if it is venous bleeding. In any instance, the formation of a clot acts as a plug in the cut vessel and helps to control bleeding. Do not disturb blood clots.

However, a stream of blood coming in spurts from a cut artery will not clot and artificial means must be taken to control the bleeding. This is the reason why bleeding from arteries is dangerous.

Artificial Control—Bleeding can be controlled by:

(a) Direct pressure on the wound.

(b) Pressure at some position, or positions, near the wound with thumb, fingers or other suitable object, such as a screw driver handle.

(c) Pressure around a limb by means of a tourniquet.

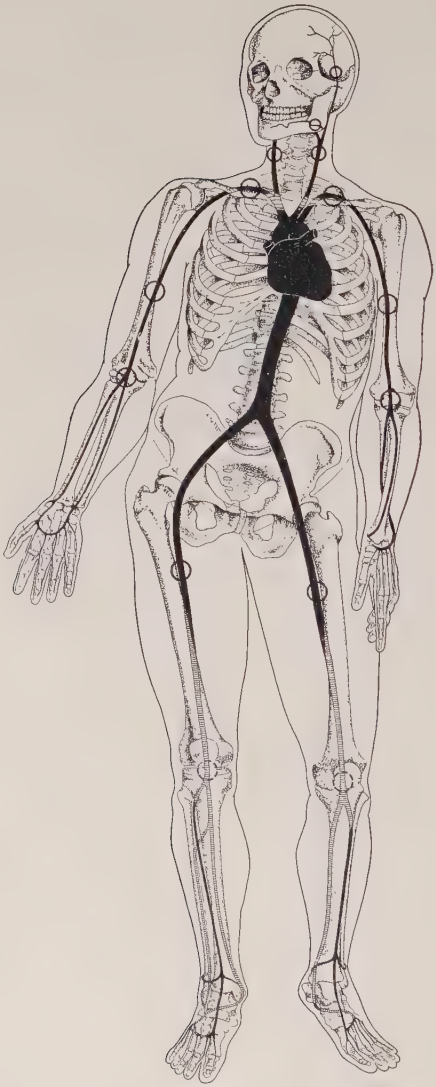


FIG. 32.—The arteries and pressure points.

Direct pressure on the wound will usually control bleeding from veins or capillaries. Whenever possible, the wound should be covered with a compress or any clean material, sterile if possible, and then bound with a moderately firm bandage. This method by means of pressure compresses the cut vessels, thus stopping blood flow and assisting in the formation of clots.

Another effective way to check bleeding is by pressure of the thumb or fingers at a point a little away from the wound and directly over the blood vessel. In bleeding from an artery this pressure must be exerted as near the wound as practical, between the wound and the heart, because in the arteries the blood is flowing from the heart.

In case of venous bleeding, the pressure must be made on the side of the wound away from the heart, since the blood is returning to the heart.

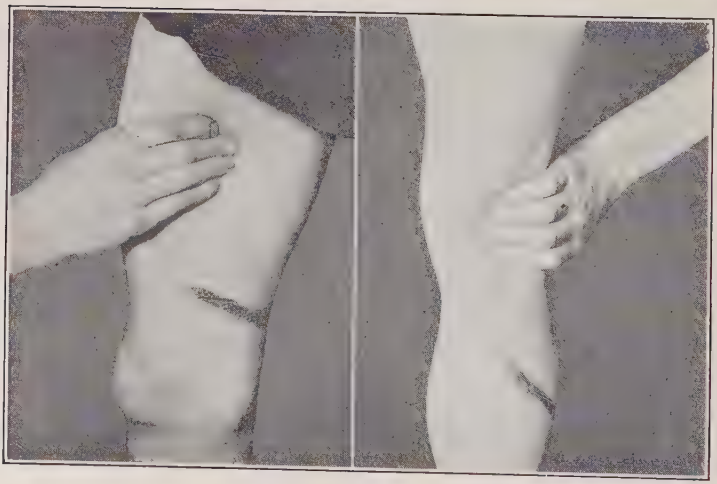
Pressure Points on Arteries.—Since arterial bleeding may prove fatal if not quickly checked, it is necessary to know where the arteries lie close to the skin and over a bone against which they may be pressed. For that reason, study carefully the illustrations, Figures 32, 33, 34 and 35.

Head or jaw. Mouth or cheek. Forehead.

FIG. 33.—Pressure points.

At or near shoulder. At or near elbow. Forearm or hand.

FIG. 34.—Pressure points.



Leg above knee Leg below knee or foot.

FIG. 35.—Pressure points.

Tourniquets—Their Use and Dangers.—If the bleeding can not be controlled promptly by pressure either directly over or near the wound, then, and only then, should a tourniquet be used. Tourniquets are almost always used to stop bleeding from the larger arteries. A tourniquet consists of a band to go around an arm or leg, a pad to press on the artery, and some means for tightening the band, causing the pad to press on the artery. (Fig. 36.)

The band for a tourniquet may be improvised from a handkerchief, necktie, suspenders, belt, triangular bandage, or a piece of rope. A tightly rolled bandage, a smooth round stone, or some object of similar shape may be used for a pad. In applying a tourniquet place the pad over the pressure point, under the band. Tie a knot in the strap, or band, and slip a pencil or stick under this knot and twist it until the desired pressure is exerted against the artery. (Fig. 37.)

Refer to Fig. 23 for special hand bandage used to control bleeding.

Placing. Tightening. Releasing.

Fig. 36.—Tourniquet.

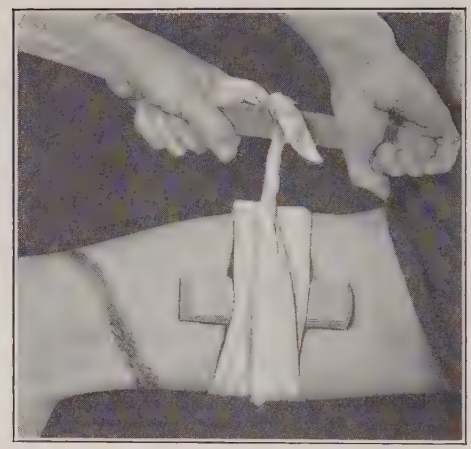


Fig. 37.—Improvised tourniquet.

Whenever a tourniquet is used, the First Aider should realize that in consequence of cutting off the circulation of the blood in the arm or leg for a considerable time, serious results may follow. Therefore, a tourniquet should be removed as soon as practicable.

In any event, the tourniquet should be slowly loosened slightly at least once every fifteen minutes in order that circulation may be temporarily restored in the injured member. If bleeding recurs, retighten the tourniquet.

Whenever an injured person with a tourniquet on his arm or leg is turned over to a physician, the physician should be informed of the tourniquet, its location, time when put on and the last time it was loosened.

A tourniquet should never be covered with a dressing as it may thus be so concealed that its presence is not known.

Precautions after Bleeding Is Controlled.—After bleeding has stopped, either naturally or by artificial control, and iodine has been applied, the wound should be covered with a compress or piece of sterile gauze. If

this material is not immediately available, it should be applied to the wound as soon as possible.

Keep the injured part as quiet as possible, because movement of the part may cause the bleeding to begin again.

Do not disturb blood clots.

Do not remove a compress from a wound until directed to do so by a doctor, where bleeding was so severe that a doctor was called. In other cases do not remove compress until you are satisfied that the wound is healed sufficiently to permit the removal of the compress without causing the blood clot to be disturbed, or in other words, the resuming of bleeding.

If after bleeding has been controlled, the patient shows signs of faintness due to the loss of blood, use ammonia inhalants, as described on page 59.

Bleeding from Sources other than External Wounds.

Bleeding from the Mouth.—Profuse bleeding from the mouth, except in accidents to the mouth and from nosebleed, comes either from the stomach or lungs. If the blood comes from the stomach, it is generally dark colored and contains food particles. If it comes from the lungs it is bright red in color and contains air bubbles.

To control bleeding from the stomach or lungs:

1. Get a doctor at once.
2. Avoid excitement and allay anxiety on the part of the patient.
3. Keep the patient quiet, lying on his back in a comfortable position. Turn the head so that the blood runs out without being drawn into the lungs.
4. Apply ice bags and cold compresses to the chest or upper abdomen.

Nose Bleed.—This is a very common occurrence and is usually only a trifling affair but if the bleeding continues it should be stopped by artificial means.

An effective method is to hold the nostrils together. Another method is to hold the head backward and apply cold cloths or compresses over the nose and to the back of the neck. If bleeding continues, send for a doctor.

Varicose Veins.—These are enlarged veins close to the skin and generally occur in the legs. They are easily injured and may bleed freely. Press over the bleeding point with your finger covered with a compress or a clean handkerchief. Get a doctor. If bleeding stops before the doctor arrives, place a compress over the wound and bandage firmly.

Chapter V

RESCUE AND ARTIFICIAL RESPIRATION

Rescue

Getting Ready for the Prone Pressure Method of Artificial Respiration.—When a person has received a severe electric shock, been subjected to poisonous gases or has been removed from the water in a drowning condition, or has been otherwise suffocated, the breathing has usually stopped. In accidents of these kinds speed may save the patient's life, so do not waste a second. Send for a doctor at once, but do not neglect the patient to do so.

Unconsciousness must not be confused with the stopping of breathing. If an injured person is unconscious but breathing, do not apply artificial respiration. When breathing has stopped, the first thing to do is to get the injured person to a location where first aid can be performed. This may involve considerable danger to the rescuer because the manhole may contain poisonous gases or the injured person may be in contact with a dangerous circuit. The following precautions are therefore of the greatest importance, because, if the rescuer fails to observe them, there is always the possibility of serious consequences not only to the injured person but to the rescuer as well.

Before going into a manhole to save a person overcome by gas obtain a hand-line. Pass one end of the line twice around your own body under the arms and have it tied securely. (Fig. 38.)

Take the other end of the line down in the manhole with you to secure it to the victim just as it is secured to you. Leave the loop up on the ground. Assistants can then pull you out if you are overcome.

In taking a man off a pole carry a hand-line up the pole, pass it over the first crossarm above the man. Tie

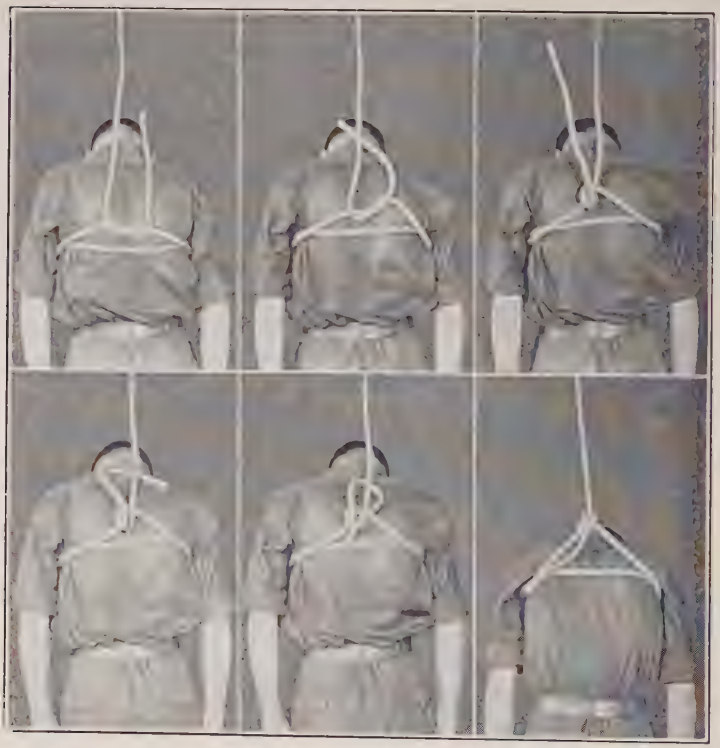


Fig. 38.—Tying hand-line.

the end of the hand-line around the man's body under the arms. If you can, throw the hand-line around him and do not waste time trying to get the line twice around his body. If the man has on a body belt, the line may be passed through the two Dee rings and tied securely.

Drop the other end of the line to those on the ground and have them draw it taut. Clear the injured man's safety strap and spurs and have those on the ground lower him as you guide him down the pole.

If you are alone with the injured man, instead of just looping the hand-line over the crossarm above him, pass it completely around the arm so that there will be less strain in your end of the line as you lower him.

Usually you can most quickly clear the victim from the dangerous circuit by lifting him slightly above it while those on the ground hold the line taut. The men on the ground should then lower him slowly with the line while you guide him by the circuit. In some cases, it may be necessary to have the power shut off or to cut the circuit. In these cases be sure the victim will not fall when the current is interrupted. This can be done:

(a) By having him attached to a hand-line as has been explained, and by having the line held taut by those on the ground before the current is interrupted.

(b) By securing his safety strap before the current is interrupted; as for example, around the pole over a crossarm or, if more convenient, just over a crossarm.

If you have to cut a live circuit be sure the live end in falling will not strike you or the people on the ground, and always turn your face away to protect your eyes from the flash.

Suggested methods for removing a person on the ground from contact with a dangerous wire follow:

If you are alone with the person in contact with the dangerous wire, work a dry coat, triangular bandage, some other piece of dry cloth, a dry hand-line or rope under his body and drag him off the wire. (Fig. 39.)

If rubber gloves are promptly available grasp the injured person under the armpits or, if more convenient,

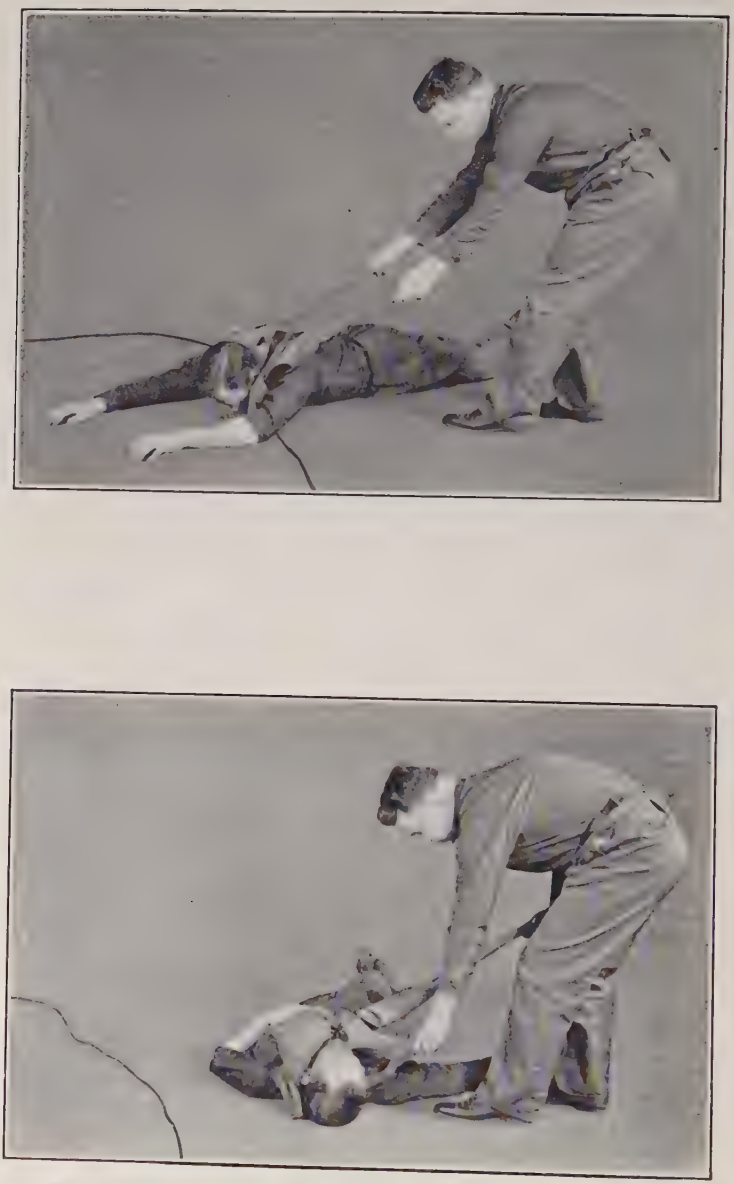


Fig. 39.—Dragging victim from electric light or power wire.

just grasp his dry clothing and lift and drag him from the wire.

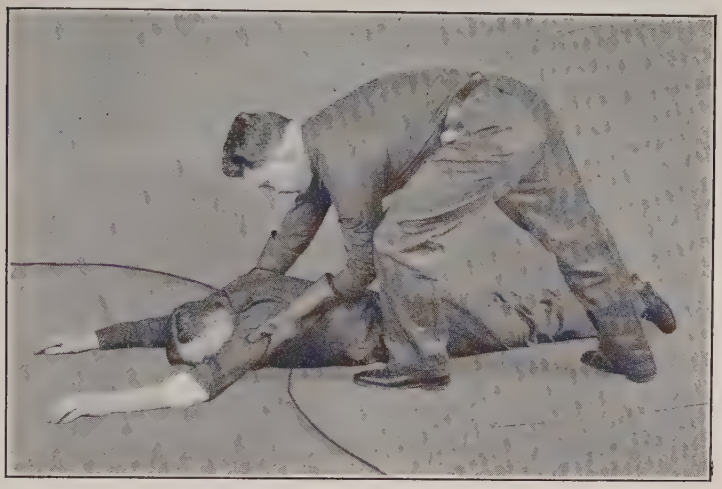


Fig. 40.—Lifting victim from electric light or power wire.

If assistants are available, raise the injured person from the wire with a dry cloth or line under his body and have some one remove the wire with a dry wooden tool handle or dry board. (Fig. 41.)

In doing all this rescue work where contact with a dangerous wire is concerned, *rubber gloves,* if promptly available, *should be worn.* Try not to touch the injured man while he is in contact with the dangerous circuit. If you have to touch him, *take hold of his dry clothing only.* Look out for his shoes, the nails are conductors and you may get a shock through them.

If a gasoline engine is allowed to run in a closed room where the exhaust fumes can not escape into the open air, the air is poisoned and any one breathing it may be overcome. First aid treatment for asphyxiation of this kind is just like that for any other case of gas asphyxiation. Get the victim out into the fresh air and use the prone pressure method of artificial respiration

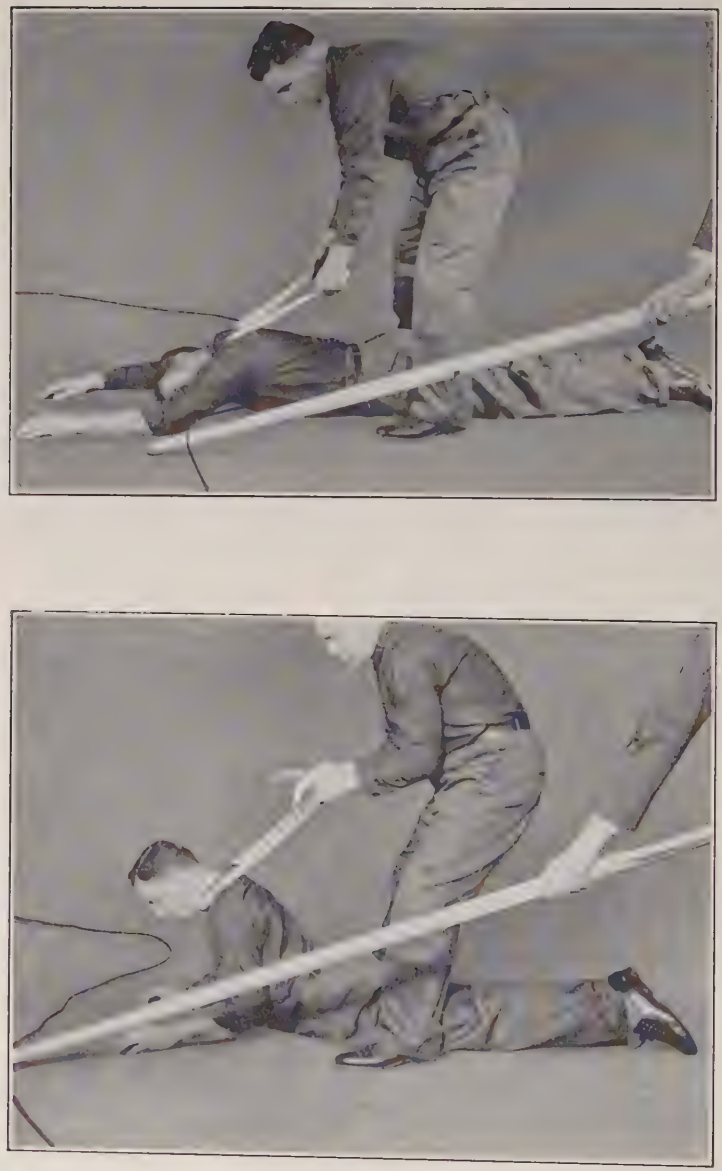


FIG. 41.—Lifting victim and removing electric light or power wire.

Artificial Respiration

Artificial respiration is necessary where normal breathing has stopped. The lungs lie within a closed cavity formed by the ribs and walls of the chest. Thus, when the size of the cavity is made smaller, air is forced out of the lungs and when the size is made larger, the lungs expand and air is drawn in.

There are a number of methods of artificial respiration. The most practical is that known as the Schaefer, or Prone Pressure, method. This consists of the regular application and release of pressure for the purpose of reestablishing breathing rhythm that has been lost. Also, successively compressing and releasing the chest walls forces out and brings a quantity of air into the air passages.

As indicated above, breathing stops as a result of any of the following causes:

1. Because the upper air passages may be filled with water, which prevents the entrance of air into the lungs, as in the case of drowning.
2. Because the upper air passages may be filled with certain gases which, like water, prevent the entrance of air into the lungs.
3. Because the poisonous gases which have been absorbed may get directly to the nerve center which controls breathing and interfere with its normal activity.
4. Electric currents traversing the body, may disturb the rhythm of the nerve impulses controlling breathing and cause it to stop.

Description of Artificial Respiration.—Artificial respiration may be analyzed under the following headings:

1. Preparation of air passages.
2. Position of the patient.
3. Position of the First Aider.
4. Mechanics of artificial respiration.
5. Additional things to be done.

The manner in which each of the above operations should be performed is as follows:

Preparation of Air Passages.—Remove any foreign substance, such as false teeth, tobacco, chewing gum, sand, gravel, etc., which may be in the mouth. This is done by forcing open the jaws and passing the index finger across the tongue to the back of the throat. Be sure the tongue is forward. If the jaws cannot be opened, do not waste time but start artificial respiration at once. If the case is one of drowning or involves vomiting, the First Aider should stand astride the patient, clasp the hands under his abdomen and raise him a short distance off the ground. Quickly repeat this several times. This causes the contents of the abdomen to move toward the head and aids gravity in removing fluids and other things from the mouth and air passages. *Remember that every moment of delay is serious* and may determine the life or death of the patient. As soon as breathing starts, if the jaws have not relaxed, again try to open the mouth.

Position of the Patient.—Place the patient face downward. The arms should be extended to the front on either side of the head. This enlarges the chest and makes room for more air in the lungs during artificial respiration. One of the arms should be bent at a right angle at the elbow, the palm downward and the patient's face resting on the back of the hand with the nose pointing toward the finger tips. This prevents dirt and other foreign substances from getting into the mouth when breathing starts.

Position of the First Aider.—The First Aider should kneel astride the patient as shown in Fig. 43. To straddle a large patient or to relieve fatigue the First Aider may elevate one knee as shown in Fig. 42. In such cases the knee which is down should be about on line with the middle of the patient's thighs.

Place the palms of the hands on the small of the patient's back, the fingers resting on the ribs, the little fingers reaching just below the last rib. The thumbs and fingers should be held naturally so as to get pressure on the heel of the palm, and the tips of the fingers should be just out of sight. The elbows should not be bent.

Mechanics of Artificial Respiration.—The procedure for applying and releasing pressure is as follows:

(a) While counting *one, two, three,* and with the arms held straight, the weight of the First Aider's body is gradually brought to bear on the lower part of the chest of the patient as shown in Fig. 44. This must not be violent as the internal organs may be injured. The lower part of the chest and also the abdomen are thus compressed and air is forced out of the lungs.

(b) At the count *three* quickly release the pressure by throwing the hands sidewise and away from the patient as shown in Fig. 45 and return to the original position. The natural elasticity of the patient's chest walls allows them quickly to expand and air is sucked into the lungs.

(c) Rest for about two seconds or while counting *four, five.* Replace your hands on the patient's back in the proper position and gradually swing forward again, thus repeating the operation.

(d) Keep a constant rhythm at all times and be particularly careful not to disturb the rhythm, if operators are changed. However, if patient gasps adjust rhythm to gasps.

The double movement of compressing and suddenly releasing pressure causes a complete respiration and should take about five seconds. The artificial breathing rate should be about twelve times a minute. Continue artificial respiration without interruption until natural breathing is restored, if necessary for four hours or

Fig. 42.—First Aider, one knee elevated, astride patient.

Fig. 43.—Prone pressure method. Starting position.

FIG. 44.—Prone pressure method. Applying pressure.

FIG. 45.—Prone pressure method. Releasing pressure.

longer, or until a physician declares that stiffening of the body has set in.

Additional Things to be Done.—After natural breathing begins carefully watch to see that it continues. If natural breathing stops after being restored, use artificial respiration again and as many times as is necessary. As soon as artificial respiration has been started and while it is being continued, if an assistant is present, have him examine and loosen any tight clothing about the patient's neck, chest, and waist, and make an effort to clean out the mouth if it has not already been done. He may also keep the patient warm with blankets, hot water bottles or other warm applications and be helpful by rubbing the patient's legs towards the heart to aid circulation. Test hot water bottles against your face to be sure that they will not burn the patient. Place the hot water bottles between the patient's legs and along his body below the armpits. As soon as the patient begins to breathe, the assistant should pass an ammonia inhalant back and forth under the patient's nose. In no case, however, should the assistant interfere with the operator, as getting the lungs working is the most important consideration. When the patient becomes conscious he may be given an internal stimulant, such as hot black coffee or tea, except when he is nauseated or vomiting. If he starts to vomit turn his head to one side and with the fingers keep his mouth clear of vomited matter. This should be done so that the vomited matter does not get back into his windpipe and choke him. Keep the patient lying down until his removal has been ordered by a doctor or suitable transportation is available.

Chapter VI

AMMONIA INHALANTS; SHOCK; FAINTING; SUN STROKE AND HEAT EXHAUSTION; APOPLEXY; EPILEPSY

Ammonia Inhalants

When a person is "knocked out" as a result of an injury or has fainted and the face is pale, the heart action will usually be weak. The pulse, which can be felt at the wrists, temples, or neck, indicates how the heart is acting. Normal pulse beats approximately seventy-two times a minute. If the pulse beats more slowly than this or is weak, or if no pulse can be felt in the wrist, the action is not normal and something should be done. An ammonia inhalant under these conditions will usually assist in bringing the heart action back to normal. In taking the pulse, use the fingers instead of the thumb since the thumb has a pulse of its own which may be confused with the patient's pulse.

To use an ammonia inhalant crush the capsule and pass it back and forth under the patient's nose. Do not hold the inhalant too near, nor continuously near the patient's nose as there is danger of injuring the sensitive tissues inside the nose. The operator should first try it on himself and the proper distance from the nose can thus be easily determined. The strength of the ammonia lasts only a short time, about ten minutes at the most, so that the inhalant should be held nearer the nose as its strength decreases. The operator can judge the strength and readjust the distance by trying it on himself about every minute.

Ammonia breathed in this way acts as a stimulant just as does aromatic spirits of ammonia taken internally and has the advantage that it may be used on an unconscious person.

Breaking. Applying.

FIG. 46.—Ammonia inhalant.

A corner of a handkerchief moistened with household ammonia may be used in place of a standard inhalant.

Shock or Collapse

Ordinarily a shock is a more or less serious depression of the nervous and circulatory system. It is sometimes called collapse or prostration and usually is associated with illness, and occurs in connection with practically all types of major injuries. In case of shock, the patient lies perfectly quiet and pays no attention to what is happening and may be unconscious. The eyes stare, may be closed or look straight ahead, the pupils are large, the skin is pale, lips and hands have a bluish tinge, the body is generally cold and clammy, and sweat drops appear

on the forehead. In cases of shock, always send for a doctor at once. Do not move the patient to another location. Keep the head and shoulders low. Apply hot water bottles or other warm applications to the body, except that these should not be applied in case of severe bleeding until the bleeding has been controlled. Cover the patient warmly and use ammonia inhalants. If the patient is conscious give an internal stimulant, such as hot black coffee, or hot tea.

In general, for all unconsciousness, if the face is pale lower the head and shoulders to induce flow of blood to the brain; if the face is red raise the head and shoulders to decrease the flow of blood to the brain. However, if there is severe bleeding from the head or shoulder always raise these parts regardless of the color of the face.

Fainting

Fainting is a partial or total loss of consciousness due to a lack of supply of blood to the brain. It may follow bleeding, exhaustion, fatigue, prolonged effort, or strong emotional disturbances like fear or surprise. The symptoms are paleness, cold perspiration, feeble rapid pulse, and shallow breathing. To overcome fainting, place the patient in the fresh air in a lying down position with the head low and the feet raised. Loosen the clothing, dash a small amount of cold water to the face to cause a sudden intaking of breath and use ammonia inhalants.

Where there is indication of faintness it may be prevented by holding the patient's head between his knees for a short interval. If this is not immediately effective do not repeat. Persons who have fainted should be kept quiet until entirely recovered. It should be remembered that a person who is unconscious from any cause needs immediate attention. There is no use in trying to arouse unconscious persons by shaking or calling to them.

Sunstroke and Heat Exhaustion

Sunstroke and heat exhaustion are both caused by excessive heat. Although excessive heat causes both of these conditions, they differ entirely with respect to the symptoms and treatment.

Sunstroke usually begins with a sharp pain in the head followed almost immediately by unconsciousness. The skin is dry and very hot, face is flushed or purple, and breathing is difficult. In treating this condition, send for a doctor at once. Move the patient to a cool place. Remove the clothing and apply cold applications, especially to the head and spine, or better still, place the patient in a very cold bath. Do not administer stimulants, because the patient is already overstimulated.

Heat exhaustion resembles shock in its symptoms. The skin is cold and clammy, the face pale, breathing is feeble and rapid, and the pulse may be weak and rapid. In treating it, first send for a doctor, then move the patient to a place where the air is fresh and as cool as possible. Keep the body warmly covered and lay the patient with his head low. Stimulants should be given when the patient is able to swallow and hot applications, such as hot water bags, applied to the body. Aromatic spirits of ammonia inhaled by the patient is helpful.

Apoplexy

Apoplexy is due to bleeding from a ruptured blood vessel inside the skull. The skull being bone and the brain being soft tissue, the accumulation of blood causes pressure on the brain and this in turn produces paralysis of the nerve centers. This condition usually occurs only in middle or old age.

Symptoms

(a) Attack generally follows excessive effort or excitement.

(b) Individual is generally paralyzed on one side of the body, either in the arm or leg, or both. Frequently the opposite side of the face will be paralyzed.

(c) Face is red.

(d) Pupils of the eyes are frequently unequal in size.

(e) Breathing is loud and blowing. This is due to the paralysis of one side of the face.

Treatment

(a) Get a doctor at once.

(b) Lay the patient on his back and raise his head and shoulders.

(c) Do not disturb the patient unnecessarily but make him comfortable. Do not move the patient until absolutely necessary and then with the greatest possible care. Moving the patient tends to increase bleeding inside the skull.

(d) Apply ice caps or cold water to the head and hot applications (not too hot) to the feet. This helps to draw the blood away from the head.

Epilepsy

An epileptic fit is a condition characterized by loss of consciousness accompanied with convulsive jerking movements of the muscles of the body. The attacks are generally preceded by a loud cry.

Treatment consists in caring for patient in such a fashion as to prevent him from harming himself. One of the chief elements of the treatment consists of placing a folded compress, piece of wood, or pleated bandage between the patient's teeth to prevent biting the tongue.

Chapter VII

FRACTURES

A fracture is a broken bone and may be caused in many ways. It is even possible to break a bone by turning an ankle or by some unusual muscular exertion.

Classification of Fractures:

(a) **Simple fracture** where a bone is simply broken and does not protrude through the skin.

(b) **Compound fracture** where a bone is broken and there is an open wound leading to the fracture or the end of the bone has pierced the skin.

(c) **Complicated fracture** where there is some feature added to a simple or a compound fracture which makes it more difficult to treat. The most usual type of complicated fracture is that known as comminuted fracture, *i.e.*, where a bone is broken into a number of parts or in more than one place.

Because of the danger of infection and the damage done to the tissues around the bone, a compound fracture is much more serious than a simple fracture, whether complicated or not.

A good slogan to keep in mind in connection with the application of splints to a fractured limb is "splint the fractured member as you find it." In other words do

not attempt to correct a deformity, set the limb or otherwise do work that requires the expert services of a doctor. The illustration, Fig. 32, shows the human skeleton.

Signs of Fractures.—One or more of the following signs may be helpful in determining whether or not a bone is broken:

(a) Pain and tenderness at the point of the break.

(b) Inability to use the broken part.

(c) Deformity or swelling of the broken part.

(d) The injured person may have heard the bone break or may feel grating at the point of break. However, no attempt should be made by the First Aider to feel or hear this grating.

Treatment of Fractures.—If a doctor's services are quickly available, it will not be necessary to remove the clothing unless there is evidence of bleeding. If the patient cannot be seen by a doctor within an hour or if there is evidence of bleeding, the clothing should be removed or cut away to determine whether or not it is a compound fracture. In removing or cutting away clothing, the patient should be handled gently. Outer clothing should be ripped on a seam if possible and the underclothing should be cut or torn carefully. In case of an injury to the foot or ankle which requires removal of boots or shoes, they should be cut off. In any case, while removing clothing and rendering first aid be very careful not to disturb blood clots.

Simple Fracture.—Send for a doctor at once. The main object of first aid treatment before the doctor arrives is to prevent the sharp ends of the bones from puncturing the skin and thus converting a simple into a compound fracture. Make the injured person as comfortable as possible and prevent the broken bone from moving. If it is necessary to move the broken bone slightly

for any cause whatever, support it firmly on each side of the break with the hands. Be sure the injured part does not bend at the point of break.

The injured person will usually be made more comfortable by supporting the broken bone on a pillow or folded coats, or other suitable materials. Cold applications gently applied at the point of fracture will usually assist in relieving the pain.

If the injured person must be moved, the broken bones should be supported with splints. Splints should be so placed and bandaged that no movement at the break is possible.

Watch the injured person closely so that shock or faintness can be treated promptly if they occur.

Compound Fracture.—Send for the doctor at once. Make the injured person as comfortable as possible. Do not let the bone draw back into the flesh as germs will be carried with it and infection may result. Do not touch the wound with the fingers or wash it with water. Paint the exposed end of the bone, the wound, and the surrounding skin with iodine. Remember to spread the iodine from the wound outward and cover the wound with a suitable sterile compress and bandage applied loosely. If the injured person must be moved, be sure there is no movement at the break. Treat for shock and faintness.

The First Aider should not attempt to set the fractured bone. Splint the injured member as you find it.

Splints.—Splints can be made of any rigid material and should preferably be slightly wider than the injured member. They should always be well padded in order

to afford as much comfort as possible to the splinted parts. The padding should extend beyond all edges of the splint. Splints may be improvised as outlined on page 37. If it is impossible to obtain anything to use as a splint, the injured member should be immobilized against the body or be tied to the corresponding member, such as tying a broken leg to a good leg.

Types of Fractures.

Fracture of the Skull.—You may sometimes feel the fracture under the skin but go about it carefully or you may injure the brain. If there is any doubt as to whether or not the skull has been fractured assume that it has been and treat accordingly. If there is an open wound, apply iodine. Do not apply iodine to wounds near the eye. If the fracture is in the lower part of the skull or above the face there may be bleeding from the nose, ears or mouth. The breath is blown from the patient's mouth. The pupils of the eyes are often unequal in size. The eyes may be bloodshot. The pulse is slow. Unconsciousness often comes on some time after the accident.

Lay the patient down with the head and shoulders slightly raised. Place cloths wrung out in cold water or containing crushed ice over the head. If an open wound is present avoid contact with the wound. Do not move the patient until the doctor comes and *never give stimulants.*

Fracture of the Nose.—If the skin is broken, paint the wound and surrounding area with iodine. Be sure the iodine does not get in the eyes. Place a padding of compresses on each side of the nose and bind in place with a bandage around the head.

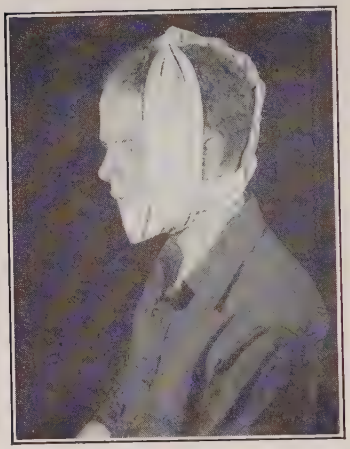


Fig. 47.—Jaw bandage.

Fracture of the Lower Jaw.—The injured person will be unable to speak or close his mouth without great difficulty and pain. The teeth will be out of line. Raise the jaw in place gently and bandage it in position with two cravat bandages. (Fig. 47.)

Fracture of the Collar-bone.—The shoulder on the injured side may sag as compared with the other shoulder and the injured person will have lost control over it. Place a soft pad in the armpit on the injured side as shown in Fig. 48. Support the forearm in a sling and tie second triangular bandage around the arm and chest.

Fig. 48.—Bandage for fractured collar-bone.

Fracture of the Spine.—If the spine is fractured the patient may be unable to move and there may be paralysis of the body below the break. *Do not move patient* except when absolutely necessary, and then only on a rigid support such as a shutter or door. Treat faintness until the doctor arrives.

Fracture of the Ribs.—When a rib is broken the injured person may have sharp pains when breathing deeply or coughing. If the lung has been punctured he may spit up bright red blood and may feel faint or will actually faint. Treatments consist in applying three triangular bandages, folded as wide cravats; first bandage being applied to lower part of chest, second to middle chest and third to upper part of chest. The purpose of this is to limit as much as possible the movement of the chest in breathing. Tie the cravats as tightly as reasonable comfort permits. (Fig. 13.)

FIG. 49.—Splint for fractured arm above elbow.

Fracture of the Arm above the Elbow.—Splint should be applied as shown. Hold the splint in place by bandages and support the injured arm in a sling. The elbow should rest snugly in a padded bend of wire splint. (Fig. 49.)

A pleated or roller bandage may be used in place of the two cravat bandages shown in Fig. 49 to hold the splint in place.

Fracture at or near the Elbow.—If the fracture appears to be at the elbow or very near the elbow, and the arm is straight, splint and bandage the whole arm. (Fig. 50.)

If the arm is not straight, splint, bandage and support the arm as for a fracture above the elbow.

Fig. 50.—Splints for fractured arm at or near elbow.

Fracture of the Arm below the Elbow.—Splint and bandage as shown in Fig. 51, and support in a sling.

Fig. 51.—Splints for fractured arm below elbow.

Two cravat bandages may be used in place of the roller or pleated bandage shown in Fig. 51 to hold splints in place.

Fracture of the Wrist or Hand.—Splints should be applied as for a fracture of the arm below the elbow and the injured member should be supported in a sling.

Fracture of a Finger.—Ordinarily fractures of the fingers are not serious. The fingers should be drawn gently into a natural position and immobilized as much as possible, using a narrow padded splint which extends beyond the finger-tip and well down into the palm of the hand. The forearm should be supported in a sling.

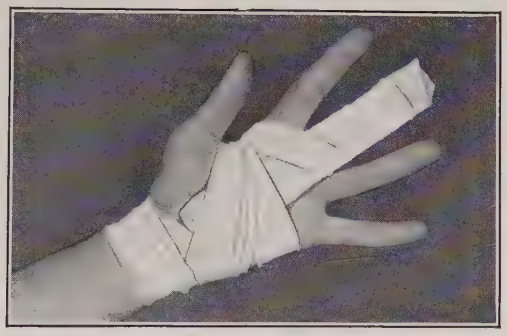


Fig. 52.—Finger splint.

Fracture of the Thigh-bone.—If there is any question as to whether or not the thigh-bone is fractured, splints should be applied extending, if practicable, from the armpit to the sole of the foot and from the crotch to the sole of the foot. If only one or no splint is obtainable, use the uninjured leg as the inner splint. In this case, place plenty of padding between the legs.

Fig. 53.—Splints for fractured thigh.

Fracture of a Knee-cap.—Splint as shown. If possible a board should be used as a splint.

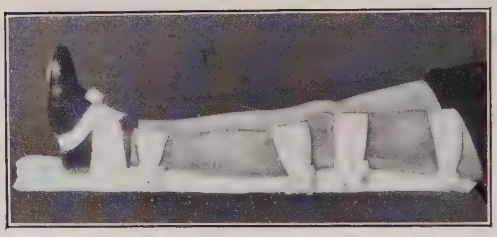


Fig. 54.—Splint for fractured knee-cap.

Fracture of the Leg between the Knee and Ankle.—Splint should be applied as shown. Either triangular, roller or pleated bandages may be used.

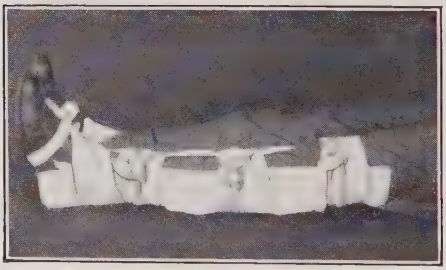


Fig. 55.—Splints for leg fractured between knee and ankle.

Fracture of the Ankle.—For a fracture of the ankle a stirrup or board splint should be applied as shown in Fig. 56.

Wire splint. Wooden splints.

FIG. 56.—Fractured ankle.

Fracture of the Foot.—A fracture of the foot is very difficult to distinguish from a fracture of the ankle and should be bandaged in the same manner.

Chapter VIII

STRAINS AND SPRAINS; DISLOCATIONS

Strains and Sprains

Strains and sprains are caused by over-stretching of muscles and tendons and are the result of violence generally applied in the vicinity of joints. The difference between a strain and a sprain is a difference of degree only, a sprain being of greater severity. Depending upon the amount of violence, there may be tearing of the small blood vessels which causes discoloration and swelling. Other symptoms are pain and limited ability to move the injured part.

Treatment.—Rest and elevation of the injured member and cold applications, such as cloths wrung out in cold water, help to relieve the pain and lessen swelling. Wrists and ankles when sprained should be bandaged snugly. Severe sprains may call for treatment at once by a doctor.

Dislocations

When a bone gets out of place at a joint the injury is called a dislocation. The joints are enclosed in flexible sacs and held together by ligaments. When a dislocation occurs these flexible sacs and ligaments are more or less torn, as are also the surrounding blood vessels, nerves and muscles. Dislocation requires prompt and proper treatment. Except in certain emergencies, no one except a doctor should attempt to reduce a dislocation because of the danger of further injury to the small blood vessels, nerves, and muscles around the joints.

Symptoms.—Deformity of the joint; marked swelling; limited function; pain.

General Treatment.—The injured part should be made as comfortable as possible and cold compresses should be applied at the joint so as to contract the blood vessels and prevent swelling.

Treatment of Minor Dislocations.—As previously mentioned, it is advisable to have a doctor reduce dislocations whenever possible. However, there are some dislocations of a less serious nature which may be safely treated in emergencies by people properly trained in first aid as follows:

Dislocation of the Lower Jaw

When the lower jaw is dislocated the mouth is held open and the injured person is unable to close it.

1. Place the injured person in a chair.
2. Bandage your thumbs with several layers of bandage.
3. Place your thumbs in the injured person's mouth and on his lower back teeth. Your fingers should be under the point of his chin.
4. Press down steadily with your thumbs on his back teeth and upward with your fingers under his chin.
5. As his jaw starts back into place slip your thumbs off his teeth, outward to the inside of his cheeks, since otherwise they may be caught between the teeth as his jaw slips into place.
6. After the dislocation has been reduced put on a jaw bandage. (Fig. 57.)

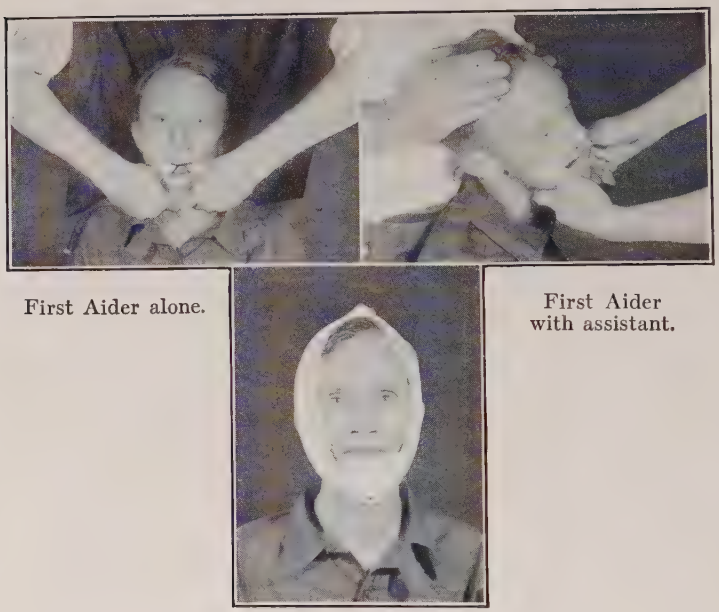


Fig. 57.—Reducing and bandaging dislocated jaw.

Dislocation of Finger.—First make sure that there is not also a fracture. If there is suspicion of a fracture, treat as a fracture as specified on page 71. To reduce a dislocation of any finger joint, except the joint of the thumb nearer the palm of the hand, stand facing the injured person and grasping the finger near the dislocated joint, pull the end of the finger towards you. Then with the thumb and forefinger of your other hand gently press on the dislocated joint until it slips into place. Reduction of the joint of the thumb nearer the hand should not be attempted except by a doctor, as there are two tendons which slip between the bones when dislocation occurs, and reducing the dislocation is therefore a difficult job.

FIG. 58.—Reducing dislocated finger.

If pain continues, a finger splint similar to that used for a fractured finger may give relief. (Fig. 52.)

Dislocation of Shoulder or Hip.—Dislocations of the shoulder or hip are very serious and require the prompt services of a doctor. In either case the patient should lie on his back and be made as comfortable as possible, using a pillow, folded clothing or other suitable material to support the injured part. Patient should be treated for faintness if it exists.

In emergency cases where the doctor cannot arrive promptly and it is necessary to move the patient more than slightly, the dislocation of the hip should be immobilized in the same manner as for a fracture at the same location.

Except in rare cases where the form of dislocation does not permit, a dislocated shoulder should be immobilized by the same method of bandaging as is used for a fractured collar-bone, except the use of pad under the armpit should be omitted and a cold, wet compress placed on the shoulder. (Fig. 59.)

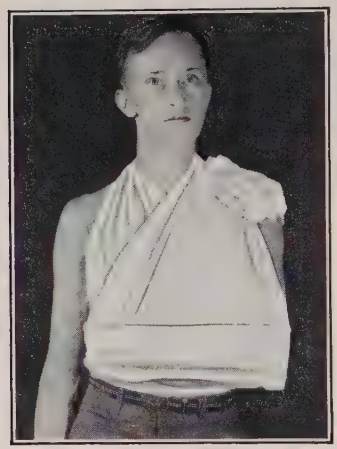


FIG. 59.—Bandage for dislocated shoulder.

If the injured man's shirt has been removed place a compress between the abdomen and the arm and hand so that these will not rest against his bare body.

Chapter IX

BURNS AND SCALDS; BLISTERS; FROST BITE

Burns and Scalds

Classification and Description.—Burns and scalds are of three kinds:

(a) First degree where the skin is simply reddened.

(b) Second degree where blisters are formed.

(c) Third degree where the tissues are destroyed.

The first effect of heat is to cause the blood vessels to expand; this causes the skin to become red. If the heat is applied longer the expanded blood vessels become paralyzed and leak blood serum into the surrounding tissues, thus forming blisters. If the heat is applied still longer the tissues are killed. Dead tissues may be recognized by the charred condition of the skin or by the absence of color in the scalded portion as from moist heat. *Extensive* burns of *any degree* are dangerous and may endanger life.

Carbolated Petrolatum.—The carbolated petrolatum is to be used for any type of external burn. After the burn has been treated with petrolatum it should be covered with a compress and, if desirable, the compress should be held in place by a bandage.

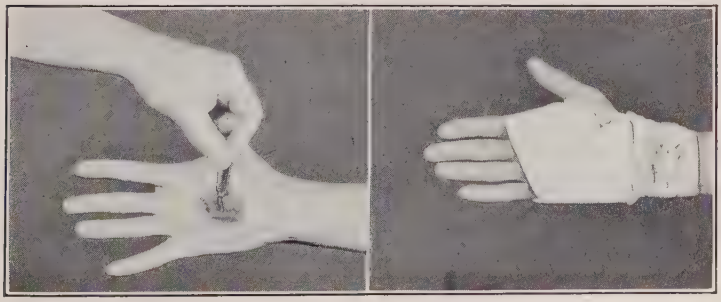


Fig. 60.—Dressing for burn.

The carbolated petrolatum, the compress, and the bandage exclude air and the petrolatum has a soothing effect, thus lessening the pain. Where clothing sticks to a burn, do not attempt to pull it off. Cut around it and have a doctor remove the part that is stuck. In case a considerable portion of the body is burned, it may not be possible to cover the entire surface with petrolatum and in such cases some relief may be given until the doctor arrives by covering the burned surface with a sheet or cloths soaked in linseed oil, olive oil, or similar oils.

General Treatment.—First aid treatment of burns particularly should be considered a temporary expedient, if at all severe. Subsequent care of the burn rests with the doctor in charge. All third degree burns, and first and second degree burns which cover large surfaces, are serious.

The underlying principles in the care of burns are:

(a) Prevention of infection.

(b) Ease with which first aid dressings can be removed.

(c) Lessening of pain.

The dressing used is carbolated petrolatum, which serves several purposes: the carbolic acid which it contains prevents the growth of germs and lessens the possibility of infection; the petrolatum base enables the dressing to be removed without damage to the mending tissues and decreases the pain to a certain extent. The general treatment for burns is as follows:

Cover the entire burned surface with carbolated petrolatum and apply a compress of gauze or similar material. The carbolated petrolatum may be applied to the compress which is to go on the wound, but if this is done be sure the entire surface of the compress in direct contact with the burn is covered with the petrolatum. Large blisters, produced by a burn, should

not be opened except by a doctor. *Never* apply cotton as it will stick to the burn and when removed will further injure the tissues. The compress should be held in place by a firm, but *not tight,* bandage over its entire surface. Do not apply iodine to a burn and do not attempt to remove wax, metal, or like substances which have caused a large burn.

Acid and Alkali Burns.—Burns caused by an acid or alkali should first be held in running water or flushed with water to wash away the chemical. This is true of all chemical burns, including those to the eye. For other than eye burns a dressing of carbolated petrolatum with compress and, if desirable, a bandage, should then be applied. For chemical burns of the eye the dressing should be a compress (except that the 1 inch compress should not be used) saturated with water and, if desirable, covered with a bandage.

Electric and Solder Burns.—Electric and solder burns are treated in the manner described under General Treatment. They are often of third degree type and need medical care. In the case of electric burns, artificial respiration and treatment for shock should be given at once when necessary before attempting to treat the burn.

Blisters

Blood or water blisters are caused by pinching, chafing or some local irritation of the skin's surface. The treatment is similar in both cases.

Puncture the blister at the edge very carefully with a needle. The needle should first be sterilized in an open flame. Use iodine on gauze to wipe off the point of the needle. Apply a small amount of iodine to the part where you intend opening the blister, taking care not to use too much iodine; then puncture the blister and apply general pressure to its outside margins, gently pressing out the water or blood, as the case may be. Apply carbolated petrolatum and a dressing held

in place by a light bandage. This treatment should also be applied to blisters that have already broken. If the blistering is very extensive or at the first evidence of redness or inflammation, a doctor should be consulted.

Frost-Bite

Frost-bite is due to the local effect of cold on the body which causes the part to freeze. This usually occurs to the nose, ears, toes, and fingers and may be the result of insufficient clothing, and poor circulation of the blood. It may be prevented by wearing sufficient suitable clothing and rubbing any part of the body which becomes very cold in order to increase circulation, thereby supplying it with warm blood.

Frost-bite may sometimes occur without the person being aware of it, but usually the part affected becomes painfully cold and then loses its feeling. The color of the frozen part is white or grayish white.

Treatment.—The frozen part should gradually be restored to its normal temperature. This should be done by vigorous and continuous rubbing of the frozen part with snow or very cold water. As circulation is restored, *gradually* change from ice water to cold water, and finally to water at room temperature.

Precaution.—Keep the part affected away from heat and do not use warm water until circulation is restored as it may kill the tissues.

Chapter X

FOREIGN BODIES; HERNIA; BITES

Foreign Bodies

Foreign bodies get either into the hollow cavities or open spaces of the body, or in the soft parts, and cause:

(a) Discomfort through irritation.

(b) Injuries due to cuts, scrapes, or burns.

(c) Infection due to introduction of germs.

Examples of familiar cases are a fishbone in the throat, a cinder in the eye, and a splinter in the hand. If the foreign body cannot be removed readily, or if there is any sign of infection, go to a doctor at once.

Foreign Body in the Eye.—"Something in the eye" is perhaps the most common of the foreign body injuries and is usually due to flying cinders, a bit of dirt, or other small particles. Improper removal may cause mechanical damage to the eye and infection. There are two classes of foreign bodies in the eye: those on the surface of the eye or the lids, and those imbedded in the eye. Those on the surface can be removed by using the corner of a clean handkerchief or compress, except that the one inch compress should not be used because it has been treated medically and may further irritate the eye. If after one or two attempts the foreign body can not be removed do not continue, but consult a doctor. Never attempt to remove a particle from the eye with a match, toothpick, knife blade, pencil, or similar object. Particles imbedded should be removed by a doctor only. The eye is precious—do not take undue chances.

Treatments and Precautions

(a) An eye containing a foreign body speedily becomes filled with tears. Keep the eye closed, place a finger over the opposite nostril and blow vigorously. This tends to suck the tears down into the nose and promotes a flow of tears across the eye, thus washing the foreign body out or into view where it can be easily removed.

(b) Grasping the eye lashes of the upper lid and pulling the upper lid down over the lower lid and releasing it, often serves to remove the foreign body.

(c) In examining the eye for a foreign body, spread the lids apart with the thumb and index finger. This exposes a considerable portion of the surface of the eye and some of the surface of the lids.

(d) In the majority of cases, the particle may be promptly removed. At other times, small chips of glass, sharp pointed particles of steel, etc., may have become imbedded in the eye. In such cases a doctor should be consulted promptly. The eye-lid should first be closed and a cold, moist compress applied and held in place with an eye bandage as shown in Fig. 12. This keeps the eye at rest.

(e) Never rub the eye. The rubbing will do more harm than good and may imbed the particle in the lid or eyeball. Particles of plaster, or other foreign matter containing lime, cause considerable discomfort and damage, due to burning. Drops from a storage battery (electrolyte, sulphuric acid solution, etc.), particles of sediment in a storage battery or strong acid fumes will also cause burning. In either case, flush the eye with cool water. This may be done by submerg-

ing the eye in the water and opening and closing the lids.

Foreign Body in the Nose.—Adults seldom get foreign bodies in the nose. The usual types of foreign bodies which may get in a child's nose are peas, beans, corn, etc. The danger of such foreign bodies is that if left too long in the moist canal they absorb water and swell, thus making their removal difficult. Holding pepper close to the nose, or using some other method of causing an individual to sneeze, may dislodge the foreign body if used promptly. If it is not easily removed, a doctor should be called at once.

Foreign Body in the Ear.—A foreign body in the ear may be the source of a great deal of pain or injury and it is best in such cases to see a doctor at once. An insect in the ear may be removed by turning the head so that the injured ear is uppermost and then fill the ear with water, preferably lukewarm. This will usually wash out the insect. Avoid inserting sharp objects into the ear.

Foreign Body in the Throat.—Common foreign bodies in the throat are chicken bones and fish bones. Occasionally they can be seen if the mouth is opened wide, in which event they can be removed with the fingers. If they go further down, call a doctor at once. In the meantime causing the individual to vomit may dislodge the foreign body. The individual should be carefully watched and if there is abdominal pain or other discomfort continues, a physician should be consulted immediately. No laxatives or other drugs should be taken.

Foreign Body in the Windpipe.—This accident usually occurs when a person with food in the mouth, or while holding pins, nails, tacks, or other foreign bodies in the mouth, laughs or coughs. The indrawn breath carries the foreign material down into the windpipe.

In such cases, call a doctor at once. The individual should assume the position most favorable to comfort and be cautioned to breathe as carefully and slowly as possible in order to prevent the movement up or down of the foreign body. Violently shaking the individual with the head hanging down, a firm blow between the shoulders, and other sudden jars may tend to dislodge and expel the foreign body.

Foreign Body in the Soft Parts (Splinters, etc.).—If the foreign body is so near the surface that it can be picked out or squeezed out, apply iodine and remove the foreign body at once; after which the wound should be made to bleed as freely as possible, thus washing it out from the inside. After bleeding has stopped, apply iodine into the wound. Follow this with a suitably applied compress. When the foreign substance cannot be removed by these means, or if there are signs of infection, consult a doctor.

Hernia

In a general sense, the term hernia means the transfer of one or more organs from their normal position through a body partition to an adjacent position. The term is most commonly applied to the well known rupture or hernia in the abdomen. Rupture means the descent through the lower part of the abdominal wall of some portion of the contents of the abdomen.

Human beings are born with a natural weakness in the lower abdomen, which is more pronounced in men than in women. Because of this fact, a hernia or rupture may be produced by moderate exertion such as that produced by coughing, jumping, or improper position while lifting.

Signs.—The visible sign of abdominal hernia or rupture is as follows: a swelling in the groin, which may

extend downward into the scrotum and which frequently disappears when the individual lies on his back.

A hernia or rupture to be attributed to physical effort should be associated with certain very definite signs which occur at the location of the hernia as follows:

1. Immediate pain.
2. Immediate disability due to the pain.
3. Immediate swelling.

Precautions.—The important dangers in connection with a hernia are:

1. If gentle pressure over the swelling does not cause it to disappear immediately, there is always the danger that further swelling may occur and the hernia become strangulated, which may result in stoppage of the bowels and other serious conditions.
2. If there is very much unskilled handling of a hernia, serious damage may be done to the portion of the contents of the abdomen which make up the hernia.

Treatment.—The procedure to follow in case of hernia, even though the hernia slides back into place, is as follows:

1. Send for a doctor.
2. Place the individual on his back with the hips elevated in order that gravity may tend to pull back into the abdomen whichever organ has been forced through the abdominal wall.
3. Apply cold compresses (the colder the better) to the hernia to drive as much of the blood as possible away from the swollen tissue and thus reduce the mass of the hernia so that it will more readily slip back into the abdomen.

Bites

Dog, Snake, and Other Animal Bites.—All animal bites, such as by dogs, cats, rats, and snakes should immediately be made to bleed freely, thus tending to clear the wound of poisons and germs. This may be done by:

(a) A slight pressure at the sides of the wound.

(b) Sucking the wound. Be careful not to suck the wound if there are any cuts or sores in the mouth and be sure to spit out the blood or poisons drawn from the wound.

(c) Opening the wound with a clean, sharp knife to make it bleed freely.

See a doctor at once to have the wound properly burned or cauterized. If a doctor cannot be reached at once, he should be consulted as early as possible within the next few hours because of the possible danger of rabies as the result of animal bites.

If a limb is bitten by a poisonous snake, immediately put a tourniquet without pad around the injured limb between the wound and the heart to prevent the poisons from circulating into other parts of the body. The usual precautions should be observed for loosening the tourniquet temporarily at intervals of about fifteen minutes.

Of over one hundred kinds of snakes in this country, only relatively few kinds are poisonous and the only other dangerous reptile is the gila monster, found in the southwest. It is therefore advisable for persons to make themselves familiar with the kinds of poisonous snakes found in the sections of the country in which they are working, to know where they are usually found, the manner in which they may attack people, and any special authorized treatments for their bites.

Rabies (Hydrophobia).—Since rabies is extremely dangerous, every precaution should be taken to prevent it as a result of animal bites. The usual manner in which

it is transmitted is through the bite of a mad (rabid) dog, although it may be transmitted by any other kind of animal infected with rabies. In addition to the general treatment described above, including the cauterizing of the wound by a doctor (usually consisting of the application of strong nitric acid immediately followed with strong ammonia), the dog or other animal which did the biting should be carefully watched for signs of rabies. If the animal has been killed, its head should be sent to the nearest health department or Pasteur Institute for examination. If there is any indication of rabies in the animal, the person who has been bitten should immediately obtain Pasteur treatment.

Insect Bites.—Many insect bites or stings cause irritation and in some cases they may be quite poisonous and painful. The more painful insect bites are those of the "stinging" insects such as wasps, hornets, bees, and spiders, which inject an irritating substance at the point where the skin is punctured. This expands the blood vessels near the sting and causes quick swelling and pain. A paste made of baking soda or a compress moistened in ammonia water should be used.

For the reason that many other insects, such as bedbugs, jiggers, fleas, body lice, head lice, flies, and mosquitoes may sometimes cause infection and considerable irritation, they should be eliminated wherever possible through cleanliness and sanitary measures. As further protection from flies and mosquitoes, living quarters should be properly screened when necessary.

Chapter XI

POISON IVY; OTHER SKIN IRRITATIONS; POISONS AND THEIR ANTIDOTES

Poison Ivy (also Known as Poison Oak)

Each year thousands of persons suffer from an itching and burning skin rash due to being exposed to the poison ivy plant. Most of these cases could have been avoided if the victims had learned to recognize the plant and avoid contact with it.

This plant is found chiefly along uncultivated spots such as woodland borders, along fences and stone walls, and along roadsides both in the shade and in the open. At times it grows as a climbing plant and may be found growing on telephone poles. Under other conditions it may become a crawling plant and sometimes appears as a low-growing shrub. Every part of the ivy plant is poisonous, the pollen of the flowers, the flowers themselves, leaves, berries and stems, at all seasons of the year where any part is found. Old, dry stems from the previous year's trimming have been found to be poisonous. These parts give off an oily substance which seems to be more active on dry, dusty days than on wet, damp days. When the substance comes in contact with the skin, either directly or through the air, it soon causes an itching, burning rash, and the skin will become red and swollen within a few hours. The poisoning is also characterized by small blisters which may unite into larger blisters.

Fig. 61.—Poison Ivy.

Some persons are more susceptible to ivy poisoning than others and few or none are absolutely immune, although many may think so. No one should consider himself immune.

Poisoning is more likely to result when the skin is covered with perspiration, as the substance given off from the plant adheres more readily to a moist skin than a dry skin.

Precautions.—Learn to recognize the poison ivy plant when you see it. It has long stems bearing three pointed leaves. It often bears small greenish-white flowers during the spring and early summer, but later in the season these are replaced by bunches of small white berries. The plant is more readily distinguished in the early fall as its leaves are among the first to turn red.

The flowers or berries may be obscured by the foliage and if the plant has been trimmed several times between spring and fall there may be no flowers or berries. Therefore, too much reliance should not be placed on this means of identification.

When exposed to poison ivy the exposed skin areas should be washed as soon thereafter as possible with plenty of hot water and strong laundry or other good cleansing soap making a thick lather. This should be repeated immediately four or five times. Do not scrub with a brush or rough materials as this will irritate the skin and make the rash worse. Promptly washing the part exposed with gasoline is also a preventive measure. If gasoline is used, however, all precautions should be taken to avoid the fire hazard.

Take special care in removing the clothing, particularly the shoes, to prevent the external surfaces from touching the skin. While working in poison ivy areas bathe the entire body daily and the hands, arms, and face as often as may be practicable.

Treatment.—If the rash develops in spite of the precautionary measures taken, apply to the affected part a paste made by heating strong laundry soap and a little water, to about the consistency of lard. This paste should be applied about one-quarter inch thick over the entire area involved and allowed to dry and left on over night. There should be a complete change of clothing between each application. If this does not give relief, see a doctor.

Poison Sumac

Poison sumac, if brought in contact with any part of the body, may cause an irritating rash in the same manner as poison ivy. The precautions to be observed and the treatment are the same as those described above for poison ivy. Poison sumac is a shrub or tree which may grow to a height of twenty feet. In winter the twigs are pale gray in color. The poisonous plant is distinguished from the non-poisonous sumac by its "loose" drooping clusters of berries, which are always white. The poisonous species of sumac usually grows in damp or marshy ground along the borders of ponds or lakes. (Fig. 62.)

OTHER SKIN IRRITATIONS

Chilblains

Chilblains are a skin condition which affects the feet and sometimes the hands, due to exposure to extreme cold and in some instances to heat. Individuals susceptible to this condition may prevent it by bathing the feet daily in hot water followed by cold water and a brisk rubbing.

Signs.—The skin between the toes or fingers tends to scale. Cracks appear and painful areas often occur. Many times some local infection gains entrance through the cracks with the result that the surrounding areas may be red and inflamed.

FIG. 62.—Poison sumac.

Treatment.—A satisfactory remedy in the form of a paste may be made of equal parts of Balsam of Peru, Balsam Tolu, Ichthyol, and Lanolin. This should be applied at night with protective covering. Wash off in the morning and use a fresh application the following night.

Sunburn

Sunburn is like any first or second degree burn and is treated exactly the same way.

It is a very painful affliction and may be prevented by protecting the body and avoiding exposure of the skin to the sun for long intervals before it has become accustomed to such exposure. Sunburn occurs most commonly to bathers and unless proper care is taken, may become quite serious before the extent of the burn is realized. Acquire tan gradually, not by one exposure.

Treatment.—The treatment consists of soothing applications. Carbolated petrolatum is a very good remedy. Another soothing remedy is one part of lime water and three parts of olive oil. Only first aid treatment should be given, and in severe cases, the secondary treatment left to a doctor.

Poisons and Their Antidotes

Description and General Antidote. — The nature and amount of poison taken should be found out as definitely as possible. Very often in a suspected case of poisoning, something about the nature of the poison may be learned from the color of the victim's lips, mouth, and odor of the breath. As a general thing, a poison which can be diluted with water is less likely to do damage and will lose strength when diluted. If a person can be made to vomit it will help to rid the stomach of the poison and part of the danger will be removed. This can sometimes be accomplished by tickling the palate or by giving large quantities of warm water, weak mustard water, or by a

mixture of soap and water. The chemicals which counteract the effect of poisons are called antidotes. A good *general* antidote to use in all cases for first aid treatment is milk and it can always be used safely. Other general antidotes which tend to counteract the effects of most poisons are whites of eggs, or strong tea. It is extremely important to act quickly as a delay of even a short time may prove fatal. A doctor should be called at once in all poisoning cases.

In many forms of poisoning there is considerable shock; therefore, hot water bottles and hot applications should be used in such cases.

The specific antidotes for each kind of poison is generally shown on the bottle or other container and should be used when available. In case the specific antidote is not immediately available, the general antidote described above should be used at once.

Storage of Poisons.—Medicines for external use and poisons should be kept in distinctive bottles or packages conspicuously labeled and separated from other medicines. Bottles containing poison are easily identified if wrapped with a band of adhesive tape or sand paper. There is danger in putting harmful remedies into empty bottles which are not clean and which contain the labels or parts of the labels for other remedies. All poisonous substances should be kept under lock and key out of the reach of children or other irresponsible people.

Chapter XII

TRANSPORTATION

Sometimes it is necessary to carry an injured person to another location before the doctor arrives. This should never be done, however, unless it is absolutely necessary and even in such cases, render what first aid you can before an attempt is made to carry the patient. When necessary to transport a patient it should be done properly, since the injuries may be greatly increased through improper handling. Except where the patient's face is red, he should preferably be covered with a blanket or other suitable covering to keep him warm during transportation.

In general, the best way to carry an injured person is on a stretcher. If a regular stretcher is not available, one may be improvised from a number of things, such as jumpers, coats, burlap bags, or blankets, and a pair of pike poles.

Fig. 63.—Stretcher improvised from jumpers and pike poles.

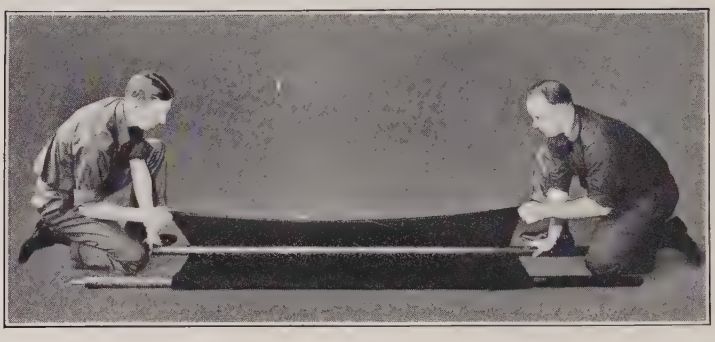


FIG. 64.—Stretcher improvised from blanket and pike poles.

A shutter, door, or ladder may also be used if available but whatever is used make sure that it is strong enough to carry the injured person. This should be determined by first testing it with one of the assistants.

When lifting or carrying the patient, one person should give all the orders and to avoid jarring the patient, all should act together. Before moving a patient with a stretcher, or three men carry in arms, preferably tie the patient's feet. (Fig. 65.)

FIG. 65.—Foot tie.

To lift the patient, three men should kneel with one knee elevated on one side of the patient. The knees on which their weight is resting should be the ones near the patient's feet, *i.e.*, on their right knees if on his right side and on their left knees if on his left side.

A fourth man should take a position on the opposite side of the patient with the stretcher, if one is available, so that he can slip it under the patient after the patient has been raised. This man should help to steady the patient while he is being lifted, and should give all orders in connection with placing the patient on the stretcher. Usually during the actual transportation the man at the head of the stretcher when the patient is being carried feet first, gives the orders.

If the patient has a fractured arm, leg, or rib, the three bearers should kneel on the side of the patient opposite the injury so that the injured part will be disturbed as little as possible. If injured on both sides, the person in charge should determine which side is best supported and should place the three bearers on that side. (Fig. 66.)

FIG. 66.—First position of bearers.

Of the three men on the one side, the man nearest the head rests the patient's head in the hollow of his elbow and places his hand on the patient's farther shoulder; the other arm is placed under the patient's shoulders. The

Fig. 67.—Preparing to raise patient.

Fig. 68.—Patient raised to bearers' knees.

man in the middle passes his arms under the patient's loins and thighs and the third man passes both arms under the patient's lower legs. The fourth man assists when the patient is raised. (Fig. 67.)

The order to raise is given by the man previously selected and the patient is raised to and rested on the knees of the three men.

The fourth man places the stretcher in front of the three kneeling men, against their toes and at the proper signal the patient is lowered from their knees to the stretcher, the fourth man assisting. (Fig. 68.)

In unloading a stretcher, the procedure is just the reverse of loading.

Three Men Carry.—If the patient is to be carried for a short distance, or through a narrow passageway, or if no stretcher is available, instead of lowering the injured man from the knees of the three bearers as described above, the patient is turned so that the front of his body is next to the chests of the three men supporting him. At a given signal they all rise, carrying the patient up in a horizontal position. (Fig. 69.)

The bearers are then in a position to transport the injured man. If the patient is to be carried forward, at the signal to proceed, each of the three bearers starts off with his left foot and keeps step. If the patient is to be carried sidewise, as through a narrow passageway, the bearers should use the military side step. In all cases, the fourth man should precede the bearers to open doors, or clear away any obstructions.

Two Men Carry.—Two men can lift and carry an injured man by each of the bearers independently grasping the patient with one arm under his thighs and the other arm around his back just under the armpits.

They should act in unison, otherwise one man will bear most of the weight. If the patient is able he should put his arms around the necks of the bearers. (Fig. 70.)

Fig. 69.—Three men carry.

Fig. 70.—Two men carry.

One Man Assist.

FIG. 71.—One man assist.

Carrying with a Stretcher.—After the patient has been lowered to the stretcher as has been described, the bearers take positions and grasp the stretcher as shown in Figure 72.

FIG. 72.—Preparing to raise stretcher.

Notice that these positions are taken so that the patient is carried feet first. Except in carrying a patient up a hill, upstairs or up other steep grades, it is better to carry the patient feet first. If a stretcher is improvised from pike poles, it is best to place a padded board across the pike poles under the patient's head. At a given signal the stretcher is raised and at another signal the three men nearest the patient's feet step off with the left foot first and the man at the patient's head steps off with the right foot. The bearers should walk with a step of about 20 inches and should raise their feet only enough to avoid stumbling.

In raising or lowering a stretcher the bearer at the patient's head must watch the bearer at the patient's feet and move simultaneously with him.

FIG. 73.—Stretcher raised, ready to carry.

To Pass a Stretcher over an Obstacle that cannot be avoided:

(a) The bearers halt so that the nearest is about three feet from the obstacle and lower the stretcher to the ground.

(b) The two bearers at the sides of the stretcher proceed to positions near the patient's head facing the stretcher. The bearer at the patient's feet executes an "about face."

(c) Together all bearers slowly and steadily raise the stretcher high enough to pass it over the obstacle. The bearer at the patient's head regulates the height and the others are guided by him.

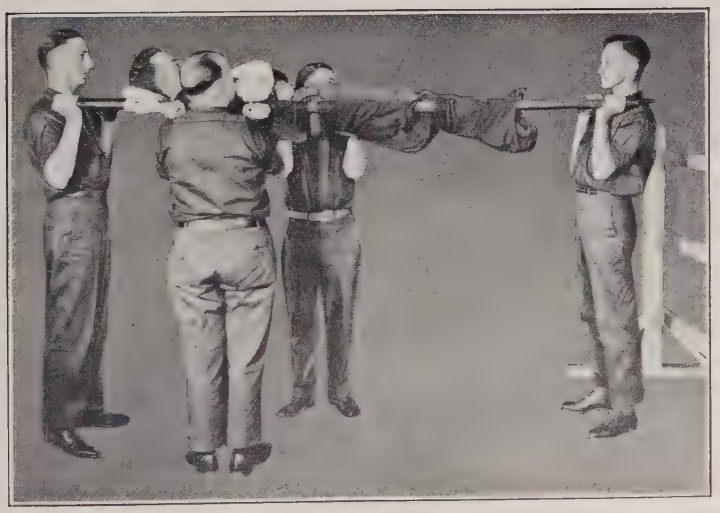


Fig. 74.—Stretcher raised, preparatory to passing over obstacle.

(d) The two bearers at the sides of the stretcher take positions near the patient's feet and relieve the bearer at that end.

(e) The bearer at the end of the stretcher at the patient's feet slowly releases his hold on the stretcher, quickly climbs over the obstacle and faces the stretcher.

(f) The end of the stretcher is passed over the obstacle to him. It should never be rested on the obstacle.

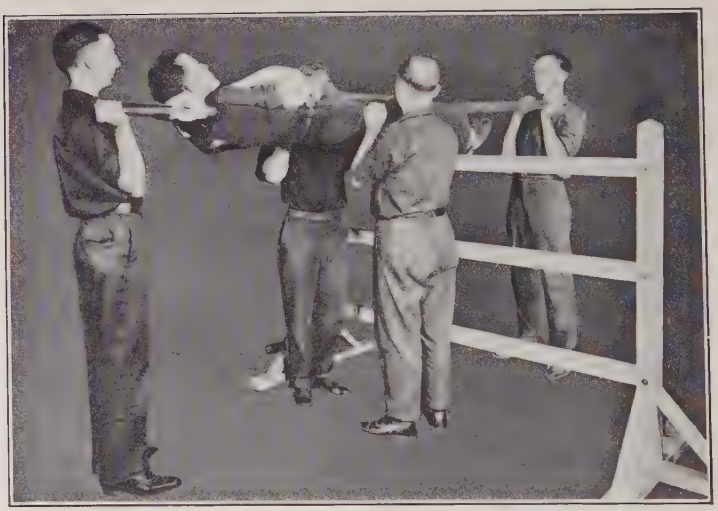


Fig. 75.—Stretcher partly over obstacle.

(g) The bearers at the ends of the stretcher proceed to pass the stretcher over the obstacle, the two on the sides assisting them.

(h) When the bearer at the end of the stretcher at the patient's head reaches the two bearers at the sides, a halt is called.

(i) The bearers on the sides quickly climb over the obstacle and relieve the bearer at the patient's head.

(j) The three bearers (one at the patient's feet and two at the sides near his head) then complete

the work of passing the stretcher over the obstacle while the remaining bearer climbs over it and assumes his position at the end of the stretcher.

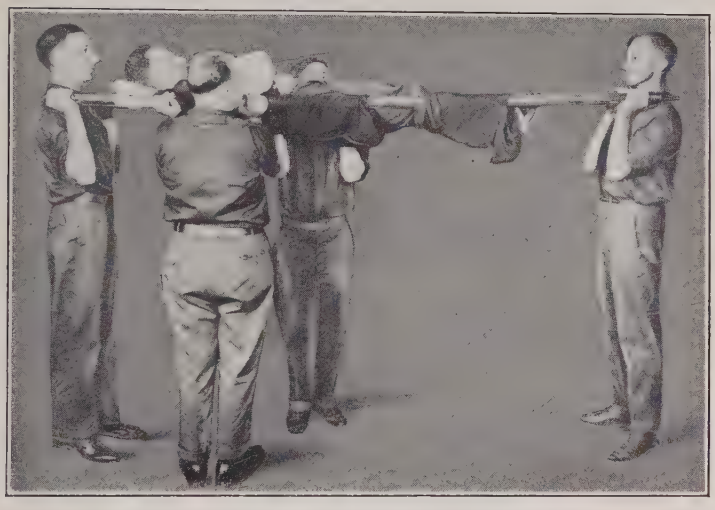


FIG. 76.—Stretcher completely over obstacle.

(k) The stretcher is lowered to the proper height for carrying.

(l) The two bearers at the sides of the stretcher proceed to positions near the patient's feet, relieving the bearer at that end while he executes an "about face." (Fig. 77.)

(m) The two bearers then proceed to their original positions at the sides of the stretcher and face in the direction the stretcher is to be carried.

(n) The bearers proceed with the stretcher, the three nearest the patient's feet each stepping off with the left foot and the one nearest his head with the right foot, in order to counteract any tendency to swing the stretcher as the men walk.

Fig. 77.—Stretcher lowered, preparatory to carrying position.

Drag.—In certain cases where there are no assistants, or where it is necessary to stay close to the floor as in a smoke-filled room, the injured man may be moved a short distance by means of the "drag." (Fig. 78.)

The drag consists of tying the patient's wrists together, inserting your head between the patient's arms, raising his head and shoulders from the ground and dragging him along as you proceed on your hands and knees.

Fig. 78.—Drag.

Chapter XIII

BELL SYSTEM FIRST AID KITS

Maintenance.—The Bell System First Aid Kits contain the standard materials with which first aid work is to be done on the job. It is therefore necessary to become familiar with their contents, to know where each article should be found and to learn the best method to use it. The list of contents inside each kit shows the proper location of each article.

When it is realized that these materials are required for emergencies, it can be understood why it is very necessary that a complete supply be kept in the kit at all times and each article located where it can be found without delay or confusion. A used article should be replaced as soon as possible so that a supply will be available for the next emergency.

General Precautions.—The information which has been given before in this text in regard to the precautions to be observed in rendering first aid should be understood thoroughly when using the First Aid Kits. It is extremely important to understand thoroughly the causes of infection in wounds and how infection can be prevented. This is discussed at length on pages 9 to 12. Thus it should be remembered when using the materials in the First Aid Kit that any article which comes in contact with a wound should be sterile, *i.e.*, free from germs. In removing any of the compresses from the kits, never touch the side that is to go on the open wound or burn. These compresses have been carefully treated so that they are sterile. If the side that is to come in contact

with a wound is touched, some of the germs on the object that touches it will pass to the compress and in turn to the wound, thus interfering with the healing and possibly resulting in blood poisoning. Everything else which is not sterile and thus may cause infection, should be kept from coming in contact with the wound.

Use of Contents.—Most of the articles included in the First Aid Kits are placed in individual packages. These packages have illustrated instructions on them which explain briefly the uses and methods of handling the articles contained therein. These descriptions and those given herein should be well understood in order to avoid the possibilities of infection in case of wounds and in order that each article can be used properly and most effectively.

PART TWO

HEALTH

INTRODUCTION

Good health is generally recognized to be the most important thing in life. Without it a person's progress is seriously handicapped and he cannot experience the enjoyment and satisfaction which can only result from being healthy. Authorities agree that usually good health may be had by following a few simple health practices which will tend to keep the body in good physical condition. It is well to remember in this connection that when one is in good health his body resistance is greater and he is then better able to throw off many infections to which he may be exposed; in other words, it is always better to keep well than to have to undergo repairs. If a person becomes ill, the important thing is to get proper attention to cure the illness as quickly as possible before it has time to cause more serious sickness or physical impairment. Some of the more important considerations which affect health are described in this text. They can be readily applied in one's every day life and their careful practice will pay big dividends in health.

Chapter I

AIDS TO HEALTH

Food

The body needs food to help it do its work, keep warm and to replace worn out tissue. Without food, life in any form cannot exist. Because of its importance, the necessity for proper food, or fuel, for the body cannot be overemphasized. All it is necessary to understand in this connection is that certain foods do certain things and are required in the proper proportions. In a general way, foods may be grouped as follows:

Kinds	Purpose
(a) Meats, fish, eggs, milk, nuts, cheese, beans, etc.	To build and replace body tissue (muscles, tendons, etc.).
(b) Sugars, molasses, jellies, preserves, etc., and the starches including cereals, bread, potatoes, rice, macaroni, etc.	To supply heat and energy for body activities.
(c) Fats, included in fatty meats, butter, cream, oils, etc.	To supply heat and energy in more concentrated form, which if not used through physical activity, is usually stored in the body as fat.
(d) Fruits, vegetables, greens, etc.	To supply lime and salts as bone building materials and to help regulate body functions.

In addition to other foods, a certain amount of rough or bulky foods as bran, whole wheat crackers, etc., are helpful to enable the bowels to act properly in eliminating waste.

From the preceding information, it is easy to understand that if more than the required amount of any kind of food is taken, it has to be eliminated by the waste removing organs (bowels, kidneys, lungs, and skin). Thus overworking these organs, throws the digestive system out of balance and, as a result, injures the health. On the other hand, not enough of any of these foods will cause undernourishment. Therefore, attention to the proper selection and quantities of foods suitable to meet the needs of the body for the work it does is highly important. Remember that, generally, the most nourishing foods are usually the most simple and least expensive. If a great deal of muscular work is done and if a person leads an active life, more of all kinds of food, especially the body building and energy giving foods mentioned in (a), (b), and (c) above, are required. If a person is less active physically, less of these foods and more of the bulky and green foods are needed. In all cases the food should be wholesome and pure.

Drink

Water is the most important single element of the body and a most necessary part of diet, for without it a person can live for only a short time, usually not more than five days. Its importance may be better understood when it is considered that the body is composed of about 75 per cent water, and that the amount being constantly thrown off by the lungs, skin, and other organs of elimination has to be continually replaced. The average person requires at least six to eight glasses of water a day unless he perspires very freely or the kidneys are very active, in which cases he will require considerably more. There is probably nothing which has as noticeable an effect on the

regulation of the body functions as the amount of water taken into the system. It flushes the kidneys and bowels and if not taken in sufficient quantities, poisonous waste substances will remain in the body and injure the tissues.

Water supplied through city waterworks and tested by competent authorities is pure and wholesome. It is necessary to be careful, however, to guard against drinking water from springs, brooks, and some private wells. Unless purified, such water may be impure although it may taste and appear good. If impure, it will cause serious diseases such as typhoid fever and dysentery and should, therefore, be avoided. If there is doubt about the purity of the water, it should be boiled for at least thirty minutes.

Milk

Milk is sometimes thought of as a drink only, but, as a matter of fact, it is one of the best foods, for it contains all food essentials except certain necessary minerals. Nothing can serve so well for the basis of a diet as milk. The frequent objection to drinking milk may be overcome by taking it on cereals, in soups, gravies, custards, on non-acid fruits, etc. When taking it as a drink, it should not be gulped down but should be taken slowly, because it is then more easily digested.

As in the case of water, milk should be pure. Milk supplied by reputable dealers under clean conditions is generally safe to use.

Buttermilk and fermented milk are both as good as milk from a health standpoint and are very helpful to the intestinal tract.

Exercise and Recreation

In order to keep all the organs of the body in a healthy condition, it is necessary for them to be properly exercised. In many cases where people lead very active lives, their regular duties provide enough exercise. In cases

where people do not lead active lives physically, exercise is not only desirable but necessary to good health. It should, however, be taken moderately at proper intervals. Whenever practicable, the best exercise is, of course, that taken in the sunshine and open air because of the additional good results which are derived from those sources. Walking, gardening, swimming, and active games of all kinds are good forms of exercise.

Recreation should be varied. If devoted too much to one or two things, it ceases to be a health practice and, in fact, may sometimes be harmful. People should always permit themselves a certain amount of time to do things which are carefree and different from their ordinary duties and which afford them pleasure. The results of such varied practices will enable one to think and act more quickly and accurately, and will improve one's work, disposition, and general health.

Sleep

Just as a machine requires inactive intervals for readjustment, so does man require sleep and rest to allow nature to make readjustments or repairs. In fact, if regular sleep and rest are not taken, substances caused by fatigue accumulate in the muscles and are very likely to undermine health. The actual amount of sleep required depends a great deal on the individual's occupation and the way in which he lives. It therefore varies with different people. However, eight hours of sleep is the usual requirement for most people and is a safe rule for the average person to follow. More sleep is necessary in our younger days when we are naturally very vigorous and use up a lot of energy.

Elimination

There are certain waste products constantly being formed in the body from food and from the tissues which are worn out and being replaced. Therefore, in order to

have good health, the body must throw off this waste material as it is formed. If it is allowed to accumulate, the poisons resulting will cause serious trouble. The ways in which this waste material is eliminated are by means of the bowels, kidneys, lungs, and skin. It is, therefore, very necessary that each of these organs function properly to do its part in elimination. For instance, the skin should be kept clean. The lungs should have plenty of air and the diet should include enough water and bulky foods to cause the kidneys and bowels to eliminate waste products as they are formed.

Bathing and Cleanliness

Washing stimulates the skin, thus assisting in proper elimination and makes one less liable to infection in case the surface of the skin is broken in any way. Where a clean skin is broken, there is less chance for germs to enter a wound and it is these germs which cause infection.

The amount of bathing necessary depends to some extent upon the work and mode of living of the person concerned. However, after finishing work which has caused one to perspire freely or where the body is dirty, a bath should be taken, and, under any circumstances, it is well to bathe at least two or three times each week. Avoid bathing within an hour after a hearty meal.

After taking a warm bath, be careful not to become chilled or go into the cool air too soon, as this may cause one to catch cold. A good practice, to avoid this risk, is to finish a bath with cool or cold water and then rub the body vigorously with a towel until completely dry.

Care of the Teeth

The teeth require constant care and should be brushed at least twice a day—after getting up in the morning and before retiring at night. Unless this is done foreign matter, such as food particles, may remain between the teeth and at the edge of the gums and thus cause the teeth

to decay or infect the gums. In brushing the teeth be sure to clean not only the front surfaces but also the inner surfaces, between the teeth, the gums, roof of the mouth, and tongue. Material such as tartar that sticks to teeth can be removed by using a good tooth-paste or powder and applying an up and down or circular motion with the tooth brush which causes the bristles to reach the grooves in the enamel and remove the foreign material. Dental floss may also be used to advantage once a day to remove particles which remain between the teeth. Infections in the mouth and cavities in the teeth produce poisonous substances which, when swallowed, may seriously affect digestion and the general physical condition.

As a matter of health insurance and economy we should see a dentist at least once or twice each year.

Care of the Eyes

If the correction of poor vision is neglected, or if the eyes are continually overworked, they become strained and show it in redness of the eyeball itself, redness of the lids, dizziness, indigestion, inability to sleep and many other nervous indications. If any trouble is experienced with the eyes, an eye specialist should be consulted in order that proper corrective measures may be applied before the defect becomes more serious. Eye glasses or eye washes not recommended by a doctor may prove harmful.

Chapter II

HYGIENIC PRECAUTIONS FOR DISEASE PREVENTION

There are a few simple rules of personal hygiene and common sanitation that everyone should know and practice as general precautions to prevent the spread of disease:

(a) Wash the hands with soap before eating. One of the most common ways of spreading disease is the "hand to mouth" method. The hands come in contact with objects having more or less germs on their surfaces, such as stair rails, doorknobs, etc., and, unless the hands are washed before eating, the germs may be transmitted to the food and taken into the body. If the hands are washed in a public place, it is important not to use a public towel as diseases are sometimes spread in this manner.

(b) Avoid the use of a public drinking cup as there is no way of telling who has used it before and what germs are on it ready to be washed down into the system. If a public drinking glass has to be used in an emergency, first wash it thoroughly with soap and hot water.

(c) Flies are about the most dangerous of all germ carriers. They are particularly attracted to food and fly from place to place, leaving and carrying away disease germs. They are among the foremost spreaders of tuberculosis, dysentery, and other serious diseases. No food should be left around uncovered and all utensils should be put where flies cannot get at them.

(d) Carefully avoid the common use of dishes and other table utensils used by sick people, as disease may easily be transmitted in this way. Such articles should be kept separate from the others and be thoroughly washed with boiling water and soap before being put to common use.

(e) The danger of spreading diseases through spitting and the carrying or blowing around of dry sputum is so great and so well known that it is prevented in most public places by law. Respiratory diseases such as colds and tuberculosis are very easily spread through this habit and it is generally recognized to be a great menace to public health.

(f) Sneezing is another very common way of spreading respiratory diseases. Avoid sneezing in the face of others, being careful to turn your head away and to cover the mouth and nose with a handkerchief when sneezing.

(g) Respiratory diseases are sometimes spread by inhaling the breath of other people. It is very hard in these days of crowded transportation facilities such as subways, trolleys, and buses, to keep at a proper distance from someone with a cold. If you have a cold, try as far as is within reason, to keep out of crowds so you will not spread the germs, and during the seasons when colds are prevalent, try to avoid any unnecessary close contact with other people.

Chapter III

RESPIRATORY DISEASES—COLDS, COUGHS, SORE THROAT, GRIPPE (INFLUENZA) AND HOARSENESS

It has been estimated that the respiratory diseases (diseases of the air passages), whether of slight or serious character, cause about 70% of all sickness. If the simple cold or sore throat is not avoided or treated immediately it may lead to some of the more serious diseases, such as pneumonia and tuberculosis. The following are some of the most common respiratory diseases with a description of their causes and treatments:

Colds and Coughs

Cause.—Colds occur more frequently during the fall and winter months, although they are by no means confined to these seasons of the year. As a rule, we are made susceptible to colds because of faulty circulation of the blood in the air passages of the nose and throat. Germs irritate the walls of these passages while in this condition and cause inflammation.

The germs may at any time be present, but need some other factor to make them active enough to produce inflammation. This factor may be in the form of lowered vitality due to insufficient rest, chilling the body, overheated air or poor ventilation, drafts, wet feet, wet clothing, or sudden changes of temperature.

The active signs of a cold are: a chilly feeling, sneezing, drying of the walls of the air passages followed by discharge of mucus, and at times pains in different parts of the body, sometimes accompanied by a feverish condition.

Treatment.—There are some simple treatments for colds which are not hard to follow and which, if taken in time, may stop its development. Drink plenty of water, a glass every hour, in which a level half teaspoonful of

bicarbonate of soda has been dissolved. Before going to bed take a hot drink, such as lemonade or milk, and bathe the feet in hot water to bring the blood back to the surface. This should only be done just before retiring, in order to avoid catching more cold. A cathartic, such as castor oil or epsom salts, should be taken to induce bowel elimination of body poisons. Take plenty of rest.

When a cold has been contracted, unnecessary exposure should be avoided in order to prevent a slight cold from becoming more serious and perhaps developing into pneumonia.

If no marked improvement is noted, or if a cough persists, consult a doctor.

Precautions.—Young people and those in early middle age should be especially careful to keep their body resistance high, as they are particularly susceptible to tuberculosis at those ages. Overindulgence in social activities and lack of nourishing food may weaken the body so that colds, pneumonia, tuberculosis and other respiratory diseases may be easily contracted. The neglected cold may be the forerunner of something more serious.

Wet shoes, stockings or clothing should be changed as soon as possible, and wherever it is impracticable to get dry clothing at once, the wet parts of the body should be kept exercised to prevent chilling. Sufficient clothing should be worn at all times to keep the body from chilling.

The air of all rooms should be changed frequently, but do not get in drafts or become chilled. It is especially important to have fresh air in sleeping rooms.

Avoid close contact with persons coughing and sneezing, and with the breath of others. A few deep breaths of fresh air after leaving a poorly ventilated or crowded room will help to clear out the air passages and stimulate circulation.

Sore Throat

Cause.—A sore throat is often due to the infection of some other part of the body and every sore throat may become serious. All sore throats in children and young adults should be regarded as possible diphtheria. If it persists for 24 hours, or if it is accompanied by any other alarming symptom, such as fever, consult a physician. Sore throats may also be caused by diseased tonsils, therefore, if they occur frequently the tonsils should be examined by a doctor to see if their removal is necessary.

Treatment.—Only the early treatment of a sore throat should be attempted without a doctor. The treatment may be started with a cathartic. Gargle the throat with a solution consisting of one teaspoonful of salt in a glass of warm water. A towel wet with cold water bound around the throat at bedtime, with a layer of waxed paper or other waterproof material over all to keep in the moisture, will often relieve and help shorten an attack of sore throat.

Grippe (Influenza)

Cause.—Colds which become obstinate and extend into the lower air passages, accompanied by much greater prostration than is commonly observed in ordinary colds, may be due to the grippe (or influenza), germ.

Treatment.—Grippe, or influenza, is a serious disease and should be treated by a doctor. The treatment should not stop after the disease has apparently run its course, but should continue until the cough has entirely disappeared and the patient has regained normal weight.

Hoarseness

Types.—Hoarseness or a husky voice is usually not serious enough to interfere with normal activities unless it lasts longer than 24 hours.

Treatment.—Inhale hot vapors from steaming water through a funnel made of a towel. This should be done for 15 minutes, every two hours until relieved. In order to avoid catching cold, this should be done at a time when it will be possible to stay indoors for two hours after the last treatment.

Other effective remedies are cold applications, a gargle of a solution of Seiler's tablets or salt.

If hoarseness is serious, frequent or persistent, see a doctor.

Chapter IV

INTESTINAL DISTURBANCES—INDIGESTION, DIARRHEA AND CONSTIPATION

Indigestion, diarrhea, and constipation with their accompanying discomforts are closely identified with the digestive system and are ailments which require prompt and proper attention.

Indigestion

Indigestion is usually caused by overeating or by eating or drinking something which disagrees with the individual or digests so slowly that putrefaction takes place before digestion is completed. Many articles of food that might be fairly well digested by themselves cause indigestion when taken with certain beverages, such as liquors, coffee, and sometimes tea and cocoa. In fact, drinking largely at meal-times of any liquids is likely to cause other food to disagree with some persons. It does this by diluting the digestive fluids and thus delaying digestion.

The signs of indigestion may be very severe. Often the trouble corrects itself, in a great measure, by an attack of vomiting. If, however, the food has passed the stomach this relief is denied and the patient suffers from nausea, sometimes accompanied by cramps, diarrhea, and fever. Often the function of the liver is disturbed and the attack is then called a bilious attack.

Treatment and Precautions.—It is necessary to remove the irritating and decomposing mass of food as soon as possible. If not too long after the meal, this may be done by causing the patient to vomit. After this has been attempted, a purgative should be taken. Until there is relief, heavy food should not be eaten but the diet should

be limited to small amounts of milk at intervals of three or four hours. Alcoholic drinks of any kind will greatly retard treatment. Whenever there is persistent abdominal pains, tenderness, nausea, or vomiting, even for two or three hours, be sure to consult a doctor at once, because these symptoms may be due to serious abdominal inflammation.

It is especially important to consult your doctor immediately if there is any indication of *appendicitis* or serious *acute indigestion.*

Appendicitis may be indicated by tenderness or pain in the abdominal region, generally on the lower right side, and in such cases be especially careful not to give any purgative or food before seeing a doctor.

Diarrhea

Diarrhea is generally due to the effort of Nature to eliminate substances which disagree with one after they have passed from the stomach into the intestines. It may accompany or follow indigestion or occur independently. In cases of persistent diarrhea, or if there is any indication of appendicitis or other serious trouble, a physician should be consulted at once. In any case, be careful not to stop diarrhea too quickly, inasmuch as it may be Nature's way of getting rid of these poisonous elements. In fact, a purgative such as castor oil will often aid in accomplishing this purpose. Be careful, however, not to give a purgative if there is any symptom of appendicitis such as abdominal pain or tenderness. In ordinary diarrhea, not accompanied by other symptoms, a half glass of milk taken every three hours until diarrhea has ceased will sometimes be helpful.

Constipation

Constipation is one of the most serious faults in proper elimination. It is usually caused by:

(a) Lack of sufficient exercise,

(b) Insufficient drinking of water.

(c) Not enough rough, green or bulky foods in the diet.

Constipation can generally be easily and simply corrected by providing these necessities. A great many of our pains and aches are due to constipation. It is frequently a cause of headaches, digestive disturbances, nervousness, and irritability.

A simple remedy is to eat ten or fifteen senna leaves at bedtime and drink a glass of water. This followed by a glass of water upon arising in the morning will often give relief. The thing to guard against, however, is the habit of attempting to correct constipation by relying upon laxatives. These are unnatural means of correction and if continued may prove harmful. The natural remedies, such as regularity of habit, proper attention to diet, drinking sufficient water and exercise, are much better. If constipation persists after applying these natural correctives, a physician should be consulted for advice.

Chapter V

HEADACHES; VERTIGO; LUMBAGO

Headaches

A headache is one of the most common discomforts suffered by individuals. It is the result of a great variety of conditions and therefore has a wide range of causes. It may be due to some local condition, such as bad teeth, inflammation of the ears, nose, or throat, or disease of some of the cavities (sinuses) connected with them. Especially is the last to be considered if there has been a recent bad cold in the head.

Overeating and eating indigestible food, as well as chronic indigestion, or such symptoms as acid stomach, nausea, or feeling of fulness after eating and belching may be associated with headache.

Headaches may be due to the action of poisons produced in the body by imperfect removal of waste matter through the kidneys, lungs, skin, and bowels.

The circulation may also be at fault. There may be heart disease or anemia, as is often found in pale, undernourished persons who exercise little and who get little fresh air. In older persons, hardening of the arteries may be the cause.

Headaches may also be due to nervous conditions, such as worry and nervous fatigue. Another very common cause of headache is eye strain and sometimes careful tests by an eye specialist show that although the vision is good, it is obtained at the expense of much effort and strain which may result in headaches, dizziness, and nausea. "Bilious headaches" or "sick headaches" usually are very severe and are sometimes accompanied by nausea, vomiting, and prostration.

Headaches may be slight, severe, dull, or sharp; the whole of the head or only a part may seem to be involved in the pain. They may come quickly and cease suddenly, and they may be more or less constant or recur at fairly definite intervals. It must be remembered that the permanent relief of the sufferer from a headache involves the correction of the physical disturbance which causes the headache.

Treatment.—The treatment naturally varies with the cause. If headache continues or recurs frequently consult a doctor to discover the cause and correct it. During the attack, hot or cold applications, such as a hot water bag or an ice cap, may give relief, depending upon the individual. Sometimes a mustard plaster, made of one part mustard to four parts flour and mixed with water or lard to make a stiff paste, applied to the back of the neck is helpful. Remove the plaster as soon as the skin is reddened so that it resembles the color of a strong sunburn. Inhalations of aromatic spirits of ammonia may relieve some headaches. If there is nausea, a glass of warm water containing a little baking soda may lessen the discomfort.

If the headache is caused by incorrect diet, a purgative such as castor oil or citrate of magnesia may be required. For habitual headache caused by persistent or continued constipation, increase fruits and green vegetables in the diet, drink more water, exercise more, and try to establish the habit of emptying the bowels at a regular time each day. If necessary, use a simple laxative, such as mineral oil or cascara, but be careful not to continue this practice.

Avoid using various so-called headache remedies recommended by obliging friends. The ingredients of such remedies may react unfavorably.

Vertigo (Dizziness)

This condition is often the result of indigestion and may be relieved by eliminating the indigestible substances

through the bowels. To do this, take a purgative and cut down on meat and greasy foods. If not relieved promptly, consult a doctor.

Lumbago (Painful back)

This is usually due to exposure to colds or drafts when perspiring. At night have someone rub the back with a very warm iron, first applying several thicknesses of newspaper to prevent burning the skin. After applying the heat, rub soap liniment well into the skin. If not relieved, consult a doctor.

Chapter VI

SYMPTOMS INDICATING CONDITIONS WHICH NEED ATTENTION

General.—Symptoms may be apparent to the person in whom they occur, to a second person, or to both. Early symptoms of sickness are often slight and may easily pass unnoticed, yet a slight trouble easily checked in the early stages, may, if neglected, grow into a serious condition. It is important then to notice even slight symptoms, first, in order to determine the nature of the trouble, and, second, to have proper treatment given as early as possible.

Many symptoms can be detected only by methods which are familiar to the doctor but very pronounced symptoms are generally evident to all. It should be remembered that when illness begins it is not, as a rule, the doctor or nurse but the patient, a member of his family, or his supervisor, who sets in motion the machinery for treatment and cure. It is, therefore, very important that everyone have some knowledge of symptoms.

Coated Tongue

A coated tongue usually indicates digestive disturbances or constipation. These faults should be corrected in the natural ways which have already been explained and if the trouble persists, a doctor should be consulted.

Bad Breath

Bad breath may come from a number of ailments. It may result from decayed teeth, a catarrhal condition of the air passages, diseased tonsils, or from indigestion. It is best, therefore, to look for and correct any of these conditions which may be the cause of the

symptom and, if the trouble persists, consult a doctor. In this connection it must be remembered that the causes of bad breath may be much more serious than its unpleasant effect on one's associates.

Condition of Skin

In cases of sickness, the skin may be dry, moist, hot, cold or clammy, and its color may be pale, yellow, bluish, flushed, or there may be a rash. All of these symptoms are closely associated with the patient's condition and should be carefully noted in rendering first aid and in order to assist the doctor in prescribing treatment.

Rashes may be an indication of diseases, such as measles, chicken-pox, or even small-pox. It is, therefore, important to consult a doctor at once if a rash appears.

Shortness of Breath

Shortness of breath other than that which immediately follows strenuous physical exertion, or which is persistent, may be an indication of several physical defects. In some cases it may be due to trouble in the breathing apparatus, improper circulation, or even heart trouble. In all cases where there is continued shortness of breath or where it recurs frequently without unusual physical exertion, a doctor should be consulted.

Localized Pain and Tenderness

Localized pain and tenderness usually indicate a trouble near the location of these symptoms. It may occur from a number of causes, such as rheumatic pains, injured muscles, tendons, and joints, or it may be associated with more serious acute troubles as is sometimes the case when located in the abdomen. In the latter instance, the pain and tenderness may indicate appendicitis or some other serious disease which requires prompt medical attention. In all such cases a doctor should be consulted at once.

Fever

Fever is one of the most important barometers in connection with sickness. It occurs with practically every form of acute illness and is caused by an increase in the internal body temperature. Fever can sometimes be noticed in its early stages by a flushed condition of the face or by warmth of the skin. It may also be apparent to the patient himself because of an uncomfortable feeling of warmth and stuffiness. If a person has a temperature a degree or more than normal, or a sudden rise in temperature, a doctor should be consulted at once. Normal temperature as taken in the mouth is usually 98 6/10 degrees. Temperature can be determined accurately by means of a clinical thermometer, which is a valuable addition to a home medicine cabinet.

Chills and Chilliness

Severe chill is usually the onset of illness and a doctor should be consulted at once. Chilliness often precedes grippe or a bad cold.

Vomiting

Vomiting may be an effort of Nature to expel substances taken into the stomach that do not agree with one. It may be due either to the fault of the substance itself or to a nervous or other physical cause which originates at some other part of the body, or may result from a mechanical stoppage. In some cases, such as poisoning, it may be desirable to cause vomiting through artificial means. This can be done by tickling the palate with the finger or by drinking some substance such as mustard water (1 teaspoonful of dry mustard to a glass of water). In all unexplainable cases, and in poisoning, or when vomiting persists, a doctor should be called at once.

Delirium

Delirium is the result of a serious mental disturbance.

In many cases of prolonged illness it is associated with fever. In other cases it may be due to some more acute illness or injury. The important thing to remember in delirium is to prevent the patient from harming himself or someone else, and to get a doctor at once.

Loss of Consciousness

Loss of consciousness may indicate a serious condition and requires the services of a physician if the unconsciousness persists or recurs. If the unconsciousness is of a sudden nature, such as that resulting from shock or fainting, an effort should be made to revive the patient in accordance with proper first aid practices. Be careful, however, while unconsciousness persists, not to give liquids through the mouth because of the danger of causing the patient to strangle.

Chapter VII

CORRECTION OF PHYSICAL IMPAIRMENTS; PERIODIC HEALTH EXAMINATION; VACCINATIONS AND INOCULATIONS; ANTITOXIN

Correction of Physical Impairments

Physical impairments which are not promptly corrected cause much suffering and disability. These impairments include such conditions as cavities in teeth, diseased tonsils, flat feet, eye strain, etc. The great danger of some impairments lies not only in the suffering caused by the diseased parts themselves, but also in their bad effects on other parts of the body through poisons from those sources getting into the system.

Periodic Health Examination

If a man has a machine which he prizes very highly, he does not think of running it continuously until it breaks down. He will inspect it at regular intervals and make minor repairs before anything serious happens. He should realize that his body is more valuable than any machine and can only work well if given considerate attention. If anything very serious happens to the body it is usually expensive to repair and, in some cases, may be beyond repair. It is easy to understand, therefore, why it is necessary to find and correct any minor defects before they become serious in order to avoid greater troubles later. The best way to do this is to have a health examination by a competent physician at least once each year or more frequently, if necessary.

Vaccinations and Inoculations

The most important means of preventing certain infectious diseases is for the body to be immune to these dis-

eases, *i.e.* for the body to contain certain protective substances which prevent one from catching the disease. The most reliable protection against such diseases as small-pox and typhoid is vaccination or inoculation.

Vaccination and inoculation consist of introducing into the body vaccines which will cause the body itself to react and form these protective substances.

The effectiveness of typhoid inoculation is well illustrated by the fact that in the World War, as a result of the entire forces being inoculated against the disease, typhoid was no factor, whereas in the Civil and Spanish-American Wars far more were killed by typhoid than by bullets.

One of the more common kinds of vaccination is for small-pox. People who have been properly vaccinated against small-pox within a period of five years are protected against the disease. Yet if it were not for small-pox vaccination, the disease probably would be more common than any of the more contagious diseases. No better proof of the effectiveness of small-pox vaccination can be given than the fact that before vaccination against small-pox came into use, in many large communities seven out of every ten adults had the disease at some time and about four out of every ten who contracted small-pox, died. Yet today, because of vaccination, we hear of it only among people who have not been vaccinated.

Antitoxin

The use of antitoxin is another means of introducing artificial protective substances into the body which cause an individual to be immune to, or assists in the treatment of certain diseases for which the antitoxin is intended. It is most commonly used for the prevention or treatment of such diseases as diphtheria and scarlet fever. Before the use of antitoxin, the death rate from diphtheria was extremely high but through the use of antitoxin, it has now been reduced almost to zero.

Chapter VIII

MEDICINE CABINETS

Medicine cabinets are for storing medicines to be used in sickness and accidents. Every home should have one if possible, or otherwise have a definite place to keep medicines where they can be readily found, preferably under lock and key and out of reach of children.

All medicines should be kept well corked and properly labeled. Poisons and medicines for external use should be kept in easily identified containers separated from other medicines. Only fresh medicines should be used, because some medicines become weaker after standing while others become stronger. For this reason it is generally best to buy medicines in small quantities.

The following list shows the contents of a typical medicine cabinet suggested for the home:

2 Ounces—Boric Acid.
2 Ounces—Aromatic Spirits of Ammonia.
1 Ounce—Tincture of Iodine. (Rubber or glass stopper bottle. Poisons should be kept separated and identified from other medicines.)
4 Ounces—Castor Oil.
4 Ounces—Rhubarb and Soda.
4 Ounces—Epsom Salts.
4 Ounces—Bicarbonate of Soda.
1 Small Bottle of Vaseline.
1 Hot Water Bag.
Adhesive plaster, absorbent cotton and gauze bandages.

Other remedies prescribed by a doctor for any special case should be kept in the cabinet. Be careful, however, *not to take medicines prescribed for another* as it may cause serious harm. Remember, only the doctor can decide whether a special medicine or remedy is good for you.

INDEX

Abdomen, bandaging, 36
Absorbent gauze compress, 17, 32
Acid, burns, 81
Aids to health, 115-120
Alkali, burns, 81
Ambulance service, 6
Ammonia, aromatic spirits of, 60, 62, 131
  household, 60
  inhalants, 45, 58, 59-61
  water, 89
Anemia, 130
Animals, bites of, 88-89
Ankle, bandaging, 22, 30, 72-73
  fractured, 72-73
  sprained, 30, 74
Antidotes, poisons, 95-96
Antitoxin, 138
Apoplexy, 62-63
Appendicitis, 128
Applications, cold, 7, 45, 46, 62, 63, 66, 67, 74, 75, 77-78, 82, 84, 87, 125, 126, 131
  hot or warm, 58, 61, 62, 63, 96, 131
Arm, bandaging, 18-19, 28, 31, 32, 35, 69, 70
  fractured, 69, 70
  sling, 18-19, 68, 69, 70, 71
Aromatic spirits of ammonia, 60, 62, 131
Arterial bleeding, 38-45
  artificial control of, 29, 39-44
  natural control of, 39
  precautions after bleeding is controlled, 44-45
  pressure points, 40-42
  tourniquets, 39, 43-44
Artificial respiration, 53-58, 81
  additional things to be done, 58
  description of, 53-54
  drowning, 47
  electric shock, 47, 48, 49, 50, 51, 52
  gas poisoning, 47, 48, 51
  mechanics of artificial respiration, 55-58
  position of the first aider, 54, 56, 57
  position of the patient, 54, 56
  preparation for, 47
  preparation of air passages, 54
  Schaefer or prone pressure method, 53-58
Asphyxiation, in manhole, 47-48
  in other locations, 51
Assist, one man, 103

Back, bandaging, 27
  fractured, 69
  lame, 132
Bad breath, 133, 134
Baking soda, 89, 123-124, 131
Bandages
  figure-of-eight, 28, 33, 35-36
  folded or cravat, 19-20, 23, 24, 25, 27, 28, 30, 32, 33, 36, 68, 69, 70
  roller or pleated, 18, 30-36, 69, 70
  six inch, 36
  triangular, 18-30, 68, 78
  types of, 18
  uses of, 17
Bandaging, abdomen, 36
  ankle, 22, 30, 72-73
  arm, 18-19, 28, 31, 32, 35, 69, 70
  back, 27

blisters, 81-82
burns, 79-81
cheek, 24
chest, 27
collar-bone, 68
dislocations, 75-78
ear, 25
elbow, 28, 35-36, 70
eye, 23, 84
finger, 31, 34, 71, 77
foot, 29, 73
fractures, 66-73
groin, 28
hand, 29, 35, 70, 79
head, 26
hip, 28, 77
jaw, 68, 75-76
knee, 28, 72
leg, 22, 72
nose, 67
ribs, 23, 69
shoulder, 27, 77, 78
sprains, 74
strains, 74
thigh, 71
to control bleeding, 29, 41
toes, 31
varicose veins, 46
wrist, 34, 70
Bathing, 92, 119, 124
Bell System First Aid kits, 109-110
Biliousness, 127, 130
Bites, animal, 88-89
dog, 88-89
hydrophobia (rabies), 88-89
insect, 89
snake, 88
Bleeding, 38
arterial, 38-45
artificial control of, 29, 39-44
blood clots, 11, 13, 39, 41, 45, 65
capillary, 38, 41
effects of, 39
factors influencing, 38-39
from lungs, 45
from mouth, 45
from nose, 46
from stomach, 45
internal, 45-46
methods of controlling, 29, 39-44
natural control of, 39
precautions after controlled, 44-45
pressure points, 40-42
tourniquets, 39, 43-44
venous, 38, 41, 46
Blisters, 81-82
Blood, circulation of, 38, 44, 123
clots, 11, 13, 39, 41, 45, 65
Bodies, foreign, 83-86
ear, 85
eye, 83-85
nose, 85
soft parts, 86
swallowing, 85-86
throat, 85
windpipe, 85-86
Breath, bad, 133, 134
shortness of, 134
Breathing, stopping of, 47, 53
Bruises, 7
Burns, 79-81
acid, 81
alkali, 81
chemical, 81
electric, 81
eye, 81
general treatment, 79-81
solder, 81
types, 79

Cabinets, medicine, 139
Capillary bleeding, 38, 41
Carbolated petrolatum, 79-81
Care of eyes, 120
Care of teeth, 119-120

Carry, three men, 101-102
two men, 101-102
Cathartics, 124, 125, 127, 128, 131, 132
Cauterizing, 89
Cheek, bandage for, 24
Chemical burns, 81
Chest, bandage for, 27
Chicken-pox, 134
Chilblains, 93
Chilliness, 135
Chills, 135
Circulation of the blood, 38, 44, 123
Classification of fractures, 64
Cleanliness, 119
Clots, blood, 11, 13, 39, 41, 45, 65
Coated tongue, 133
Cold applications, 7, 45, 46, 62, 63, 66, 67, 74, 75, 77-78, 82, 84, 87, 125, 126, 131
Colds, 123-124
Collapse, 60-61
Collar-bone, bandaging, 68
fractured, 68
Comminuted fracture, 64
Complicated fracture, 64
Compound fracture, 64, 66
Compresses, 13-17
absorbent gauze, 17
four inch, 14, 15
one inch, 14, 16
substitutes for, 14
two inch, 14, 16
use of, 10, 11, 13, 24, 25, 27, 28, 29, 35, 36, 41, 44, 45, 46, 66, 67, 75, 77, 78, 79, 80-81, 83, 84, 89
Condition of skin, 134
Consciousness, loss of, 39, 47, 61, 136
Constipation, 128-129
Controlling bleeding, 29, 39-44
Contused wounds, 8
Contusion, 7
Correction of physical impairments, 137
Coughs, 123-124
Cravat or folded bandage, 19-20, 23, 24, 25, 27, 28, 30, 32, 33, 36, 68, 69, 70
Cuts, 8, 9-12

Delirium, 135-136
Diarrhea, 127, 128
Diet, 115-117, 127, 129, 130, 131
Diphtheria, 125
Diseases, prevention of, 121-122
respiratory, 123-126
Dislocations, 74-78
finger, 76-77
hip, 77
jaw, 75-76
shoulder, 77-78
Disturbances, intestinal, 127-129
constipation, 128-129
diarrhea, 127, 128
indigestion, 127-128
Dizziness, 131-132
Doctor, obtaining services of, 6
Dog, bites, 88-89
Drag, 108
Drink, 116-117
Drowning, treatment of, 47, 53-58
Dressings, First Aid, 13-37
bandages, 13, 17-36
compresses, 13-17
splints, 13, 36-37
uses of, 13
Dysentery, 117, 121

Ear, bandaging, 25
foreign body in, 85
Elbow, bandaging, 28, 35-36, 70
fractured, 70
Electric burns, 81
Electric shock, 47-58
artificial respiration in, 53-58
rescue, 47-52
Elimination, 116, 118-119

Epilepsy, 63
Examination, periodic health, 137
Exercise, 117-118
Exhaust fumes, 51
Exhaustion, heat, 62
Eye, bandaging, 23, 84
  burns of, 81
  care of, 120
  foreign body in, 83-85

Factors influencing bleeding, 38-39
Fainting, 61
Fever, 135
Figure-of-eight bandage, 28, 33, 35-36
Finger, bandaging, 31, 34, 71, 77
  dislocated, 76-77
  fractured, 71
First Aid, dressings, 13-37
  kits, 109-110
  principles of, 5
First Aid Kits, Bell System, 109-110
Flies, 121
Folded or cravat bandage, 19-20, 23, 24, 25, 27, 28, 30, 32, 33, 36, 68, 69, 70
Food, 115-116
Foot, bandaging, 29, 73
  fractured, 73
  tie, 98
Foreign bodies, 83-86
  ear, 85
  eye, 83-85
  nose, 85
  soft parts, 86
  swallowing, 85-86
  throat, 85
  windpipe, 85-86
Four inch compress, 14, 15
Fractures, 64-73
  ankle, 72-73
  arm above elbow, 69
  arm at or near elbow, 70
  arm below elbow, 70
  back, 69
  classification of, 64
  collar-bone, 68
  comminuted, 64
  complicated, 64
  compound, 64, 66
  finger, 71
  foot, 73
  hand, 70
  knee-cap, 72
  leg between knee and ankle, 72
  lower jaw, 68
  nose, 67
  ribs, 69
  signs of, 65
  simple, 64, 65-66
  skull, 67
  slings, 68, 69, 70, 71
  spine, 69
  splints, 64-65, 66-67, 69-73
  thigh-bone, 71
  treatment of, 65
  wrist, 70
Frost-bite, 82
Fumes, exhaust, 51

Gargles, 125, 126
Gas poisoning, artificial respiration in, 47, 48, 51
Gasoline, use in ivy poisoning, 92
Gauze compress, 17, 32
Germs, 9-10, 13, 66, 80, 83, 121, 122
Grippe, 125
Groin, bandaging, 28

Hand, bandaging, 29, 35, 70, 79
  fractured, 70
  washing, 92, 121
Head, bandaging, 26
Headache, 130, 131
Health, aids to, 115-120
  periodic examination, 137

Heat exhaustion, 62
Hemorrhage, 38-39
Hernia, 86-87
  precautions, 87
  signs, 86-87
  treatment, 87
Hip, bandaging, 28, 77
  dislocated, 77
Hoarseness, 125, 126
Hornet, sting of, 89
Hot or warm applications, 58, 61, 62, 63, 96, 131
Hydrophobia (rabies), 88-89

Ice bags, 45, 131
Impairments, correction of physical, 137
Incised wounds, 8
Indigestion, 127-128
Infection, 9-12, 64, 80, 83, 86, 89, 93, 120, 125
  prevention of, 10-12
Influenza, 125
Inhalants, ammonia, 45, 58, 59-61
Inhalations, aromatic spirits of ammonia, 131
  steaming water, 126
Injured, transporation of, 97-108
  drag, 108
  foot tie, 98
  one man assist, 103
  stretcher, 97-101, 103-108
  three men carry, 101, 102
  two men carry, 101, 102
Injuries, types of, 7
  chemical, 7
  electrical, 7
  mechanical, 7
  thermal, 7
Intestinal disturbances, 127-129
  constipation, 128-129
  diarrhea, 127, 128
  indigestion, 127-128
Internal bleeding, 45-46
Internal stimulants, 58, 61, 62

Insect bites, 89
Inoculations, 137-138
Iodine, swabs, 10-11
  tincture of, 10
  use of, 9-12, 44, 66, 67, 81, 86
Ivy poisoning, 90-93

Jaw, bandaging, 68, 75-76
  dislocated, 75-76
  fractured, 68

Kits, Bell System first aid, 109-110
Knee, bandaging, 28, 72
  fractured, 72
Knot, square, 18

Lacerated wounds, 8
Leg, bandaging, 22, 72
  bleeding from, 42, 43, 44
  fractured, 72
  pressure points in arterial bleeding, 40, 42
Lemonade, 124
Lime water, 95
Linseed oil, 80
Localized pain, 134
Lockjaw, 11
Loss of consciousness, 39, 47, 61, 136
Lower jaw, bandaging, 68, 75-76
  dislocated, 75-76
  fractured, 68
Lumbago, 132
Lungs, bleeding from, 45

Manhole, asphyxiation in, 47-48
  rescue from, 47-48
Measles, 134
Medicine cabinets, 139
Methods of controlling bleeding, 29, 39-44
Milk, 96, 117, 124, 128
Mouth, bleeding from, 45
Mustard, plaster, 131
  water, 95

Natural control of bleeding, 39
Nausea, 127, 128, 131
Nose, bandaging, 67
  bleeding from, 46
  foreign body in, 85
  fractured, 67
Nosebleed, 46
Notification of supervisor, 7

Oak poisoning, 90-93
Obtaining doctor's services, 6
Olive oil, 80, 95
One inch bandage, 31, 32-35
One inch compress, 14, 16
One man assist, 103

Padding, splints, 17, 21, 31, 36, 66-67
Pain, localized, 134
Pasteur treatment, 89
Periodic health examination, 137
Petrolatum, carbolated, 79-81
Physical impairments, correction of, 137
Plaster, mustard, 131
Pleated bandage, 18, 30-36, 69, 70
Pneumonia, 124
Poison ivy, 90-93
  precautions, 92
  treatment, 93
Poison oak, 90-93
Poisons, antidotes, 95-96
  storage of, 96
Poison sumac, 93, 94
Pole, rescue from, 48-49
Precautions after bleeding is controlled, 44-45
Pressure points in arterial bleeding, 40-42
Prevention of diseases, 121-122
Principles of first aid, 5
Prone pressure method in artificial respiration, 53-58
Prostration, 60
Public drinking cup, 121
Public towel, 121
Pulse, 59
Puncture wounds, 8, 11

Rabies, 88-89
Rashes, 90, 93, 134
Recreation, 117-118
Removal of splinters, 11, 86
Rescue, 47-52
  from contact with electric light or power wire, 47-52
  from manhole, 47-48
  from pole, 48-49
  from smoke filled room, 108
Respiration, artificial, 53-58, 81
Respiratory diseases, 123-126
  colds, 123-124
  coughs, 123-124
  grippe (influenza), 125
  hoarseness, 125-126
  sore throat, 125
Resuscitation, 53-58
Rheumatism, 134
Ribs, bandaging, 23, 69
  fractured, 69
Roller bandage, 18, 30-36, 69, 70
Rubber gloves, 49, 51
Rupture, 86-87
  precautions, 87
  signs, 86-87
  treatment, 87

Scalds, 79-81
Schaefer method of artificial respiration, 53-58
Scratches, 9-12
Services, obtaining doctor's, 6
Shock, 60-61, 66, 96
  electric, 47-58
Shoulder, bandaging, 27, 77, 78
  dislocated, 77-78
Shortness of breath, 134
Signs of fracture, 65
Simple fracture, 64, 65-66
Six inch bandage, 36

Skin, condition of, 134
Skull, fractured, 67
Sleep, 118
Slings, 18, 19, 68, 69, 70, 71, 77-78
Small-pox, vaccination for, 138
Snake bite, 88
Sneezing, 122
Soap, liniment, 132
  use of in ivy poisoning, 92-93
Soft parts, foreign body in, 86
Solder burns, 81
Sore throat, 125
Spider bites, 89
Spine, fractured, 69
Spitting, 122
Splinters, removal of, 11, 86
Splints, improvised, 37, 67
  padding of, 17, 21, 31, 66-67
  use of, 36-37, 64-65, 66-67, 69-73, 77
  wire, 17, 21, 22, 32, 36-37, 66-67, 69, 70, 72, 73
  wooden, 17, 21, 22, 32, 36-37, 66-67, 69, 70, 71, 72, 73
Sprains, 74
Square knot, 18
Sterile, first aid dressings, 10, 14, 108, 109
Stimulants, internal, 58, 61, 62
Stings, insect, 89
Stomach, bleeding from, 45
Stopping of breathing, 47, 53
Storage of poisons, 96
Strains, 74
Strangulation, 136
Stretcher, 97-101, 103-108
Suffocation, treatment of, 47
Sumac poisoning, 93, 94
Sunburn, 95
Sunstroke, 62
Supervisor, notification of, 7
Swallowing foreign bodies, 85-86
Swelling of injured member, 31
Symptoms, 39, 60, 61, 62, 63, 65, 67, 74, 75, 79, 93, 120, 133

Tea, 58, 61, 96
Teeth, care of, 119-120
Temperature, 135
Tenderness, 134
Tetanus, 11
Thigh, fractured, 71
Three men carry, 101-102
Throat, foreign body in, 85
  sore, 125
Tie, foot, 98
Toes, bandaging, 31
Tongue, coated, 133
Tonsils, diseased, 125, 133
Tourniquets, 39, 43-44, 88
  improvised, 43, 44
  use and dangers, 43-44
Towel, public, 121
Treatment of burns, 79-81
Treatment of fractures, 65
Transportation of injured, 97-108
  drag, 108
  one man assist, 103
  stretcher, 97-101, 103-108
  three men carry, 101, 102
  two men carry, 101, 102
Triangular bandage, 18-30, 68, 78
Tuberculosis, 121, 122, 124
Two and a half inch bandage, 31, 32-34
Two inch compress, 14, 16
Two men carry, 101, 102
Tying pleated bandage, 34
Types of bandages, 18
Types of burns, 79
Types of injuries, 7
Typhoid fever, 117
  inoculation for, 138

Uses of bandages, 17
Uses of First Aid dressings, 13
Unconsciousness, 61, 67, 136

Vaccination, 137-138

Veins, bleeding from, 38, 41
varicose, 46
Vertigo, 131-132
Vomiting, 54, 58, 85, 95, 127, 128, 135

Warm or hot application, 58, 61, 62, 63, 96, 131
Washing hands, 92, 121
Wasp sting, 89
Water, 116-117, 123, 129
Whites of eggs, 96
Windpipe, foreign body in, 85-86
Wire splints, 17, 21, 22, 32, 36-37, 66-67, 69, 70, 72, 73
Wooden splints, 17, 21, 22, 32, 36-37, 66-67, 69, 70, 71, 72, 73
Wounds, 8, 9-12
contused, 8
incised, 8
lacerated, 8
puncture, 8, 11
Wrist, bandaging, 34, 70
fractured, 70

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